Total Backup Recovery Server for Linux

User's Guide

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Chapter 1 Introduction

1.1 Total Backup Recovery Server for Linux – a reliable solution for SMB users

You have come to rely on your servers to run your business and retain key enterprise data. Total Backup Recovery Server for Linux provides comprehensive, reliable, and cost-effective system protection and recovery for corporate servers, running Linux. With Total Backup Recovery Server for Linux you have peace of mind knowing you are protected.

Minimizes downtime

Total Backup Recovery Server for Linux enables you to restore systems in minutes, not hours or days. An entire system can be restored from an image that includes everything the system needs to run: the operating system, applications, databases, and configurations. No reinstallation or reconfiguration is required.

Ensures 24 X 7 Uptime

With the Total Backup Recovery Server systems can be imaged while they are in use, supporting 24 by 7 availability. This technology enables the product to backup and image critical operating system files, the master boot record and any partition-based boot records without requiring a reboot.

For correct backup of mission critical databases, Total Backup Recovery Server for Linux will execute your custom commands, which suspend and resume database processing, before and after data capture.

Supports Cutting Edge Technology

Businesses today are moving to leverage the latest technologies, dual-core 64 bit processors and 64 bit operating systems. With Total Backup Recovery Server for Linux, you can protect these new machines, as well as legacy ones, running one solution.

Leverages Existing Technology Investments

The product can leverage your current storage infrastructure by supporting a wide variety of storage media, so you can avoid costly hardware purchases to implement the solution. The product supports key storage technologies such as: Network

Attached Storage (NAS), USB and IEEE-1394 (FireWire) compliant storage devices, CDs, removable drives (Floppy, Zip, etc.) and shared storage. Moreover, the product ensures that you maximize the space on these resources with three levels of compression.

1.2 Features of Total Backup Recovery Server for Linux

• Image creation without system shutdown

• Total Backup Recovery Server for Linux images only backup files and useful disk information, so images are created in just a few minutes

• Support for a wide variety of IDE, SATA, SCSI, USB, and other storage media.

• support unknown partitions such as NTFS, FAT

• Support command lines for backup and restoration

• Support incremental backup and schedule backup

• Support both imaging backup and File Backup

• Support GPT hard drives and UEFI motherboards

• Support for all Linux file systems, including Linux Ext2/Ext3/Ext4 and VFAT

• Comprehensive wizards simplify even the most complex operations

• Control of data compression level, image volume splitting

• The ability to migrate data from one drive to another

• Image format is compatible to standard tar format

• Based on Linux Live CD, recovery CD/DVD has excellent compatibility

1.3 Technical support

Users of legally purchased copies of Total Backup Recovery Server for Linux are entitled to free technical support from FarStone. If you experience problems installing or using FarStone products that you can't solve yourself by using this guide, then please FarStone Technical Support.

For more information please visit http://www.farstone.com/support/.

Chapter 2 Installation and operation

2.1 System requirements

Total Backup Recovery Server for Linux requires the following hard-/software:

• Pentium or compatible PC

• 512 MB RAM

• CD-RW drive for rescue CD creating

• Mouse (recommended)

• GTK lib

• Fedora Core 6, Fedora Core 7, Fedora Core 8, Fedora Core 9, Fedora Core 10, Fedora Core 11, Fedora Core 12, Fedora Core 13, Fedora Core 14, RedHat EL 5, CentOS 4 & 5, Centos 5.5, Fedora core 14, SLES 11, Debian 6.0, OpenSuse 11.4, Fedora core 13, Ubuntu 10.10, RHEL6, Mandriva 2010.2 are fully tested and supported.

For other Linux operation systems, please try them first; or tell us to support them in the next version.

2.2 Installing Total Backup Recovery Server for Linux

To install Total Backup Recovery Server for Linux:

• Assign to the setup file the attribute “Executable”

Note:
#> chmod +x TBRLinux_Setup_en

Root privilege is needed to run above command.

• Run the setup process

Note:
#>./ TBRLinux_Setup_en

• Follow setup program instructions.

• Default install to: /usr/TBRLinux

After download TBRLinux_Setup_en to your system, if you have no execute permission, please modify file attributes of TBRLinux_Setup_en and add the execute permission, then run the application under the terminal.

2.3 Running Total Backup Recovery Server for Linux

To run the program under the X Window System interface, please first login to the system with account of root privilege.

If you are not log in by root user, you need to open terminal window in X-Window environment before run it: #> su -

Note:
The "-" after "su", input user password to enter root environment temporarily.

Then, use the below command or select Total Backup Recovery Server for Linux from the system tools menu.

Run below command to popup main UI

#> /usr/TBRLinux/tbrlinux

2.4 Removing the program

To remove Total Backup Recovery Server for Linux, do the following:

（1）Run uninstallation command line：/usr/TBRLinux/TBRLinux_uninstall

（2）Or Run installation command line with parameter "-u": TBRLinux_Setup_en –u

Chapter 3 Terminology

The following table lists the common terms and descriptions used in this document.

Total Backup Recovery® Image

A Total Backup Recovery® image is a file containing a complete copy of a computer's partitions or LVMs on that hard drive. With this image, you can transfer the contents of a hard drive to a storage medium for later restoration when needed.

Recovery CD/DVD

The Recovery CD/DVD is a Linux rescue disk. To make one, please first download an ISO file from Internet, and then burn it into a CD/DVD. Once OS recovery is needed, please boot the target computer with that CD/DVD, and run restoration under Pre-OS environment.

Image
A partition /LVM image contains all its files and folders independently of their attributes (including system files), file system super block and the Grub information. A partition image includes images of all the data as well as the zero tracks with master boot record (MBR). The file has a ".D00" extension.

Online imaging
Taking an image while the source system is in a production state (the operating system is running on the master computer.)

LVM
LVM (Logical Volume Management) provides a method of allocating space on mass-storage devices that is more flexible than conventional partitioning schemes. In particular, a volume manager can concatenate, stripe together or otherwise combine partitions into larger virtual ones that administrators can re-size or move, potentially without interrupting system use.

Chapter 4 Main program interface under X Window System

Total Backup Recovery Server for Linux features a user-friendly interface under X Window System.

The main program window contains the toolbar, and the main area. The main area contains operation icons.

Most of the operations are represented two or even three times in different window areas, providing several ways to select them for more convenience. For example, you can start the necessary operation or tool by clicking its icon in the main area

The main window contains two groups of icons.

The Main Console group contains the following operations:

• Backup – create a backup archive

• Restore – restore data from a previously created archive

The Tools group contains the following items:

• Check Image –runs the archive integrity checking procedure.

Chapter 5 Creating backup archives

To be able to restore the lost data or roll back your system to a predetermined state, you should first create a data or entire-system backup file.

Backing up the all partitions/lvm takes more disk space but enables you to restore the system in minutes in case of severe data damage or hardware failure. Moreover, the imaging procedure is much faster than copying files, and may significantly speed the backup process when it comes to backing up large volumes of data. This chapter describes creating backup archives using Farstone Total Backup & Restore for Linux GUI under X Window System.

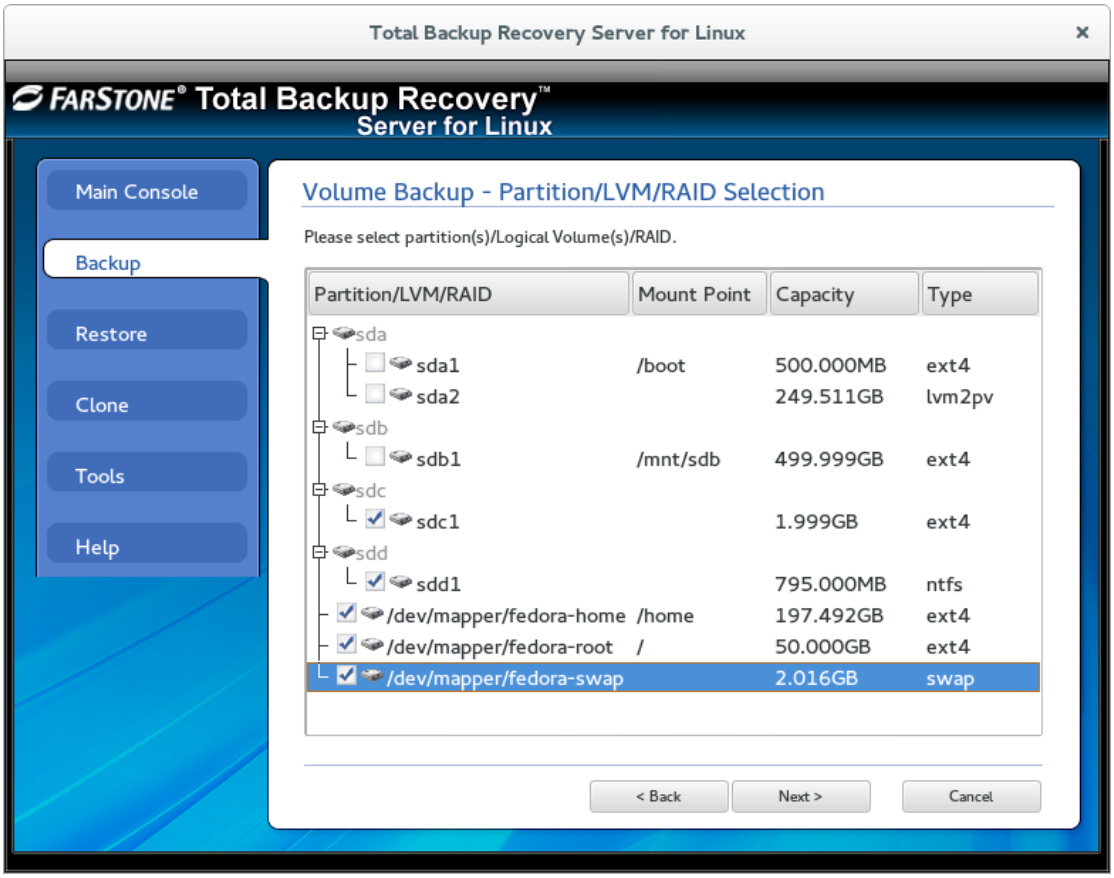
Under X Window System interface, Farstone Total Backup & Restore for Linux offers user-friendly wizards. They simplify image creation and restoration operations, so even users not very familiar with Linux can work with them.

5.1 Backup Computer

Click **Backup** on the left column, and then select **Backup Computer** at **Source Type** column, thereafter, choose **Backup Now** and **Schedule Backup** at **Backup Type** column on your own need.

5.1.1 Backup Now

1. Choose backup source
After entering Backup Now entry, you need first check the volume/LVM to be backed up.



2. Set backup destination

We'll automatically generate a path according to current time, but you may also change it.

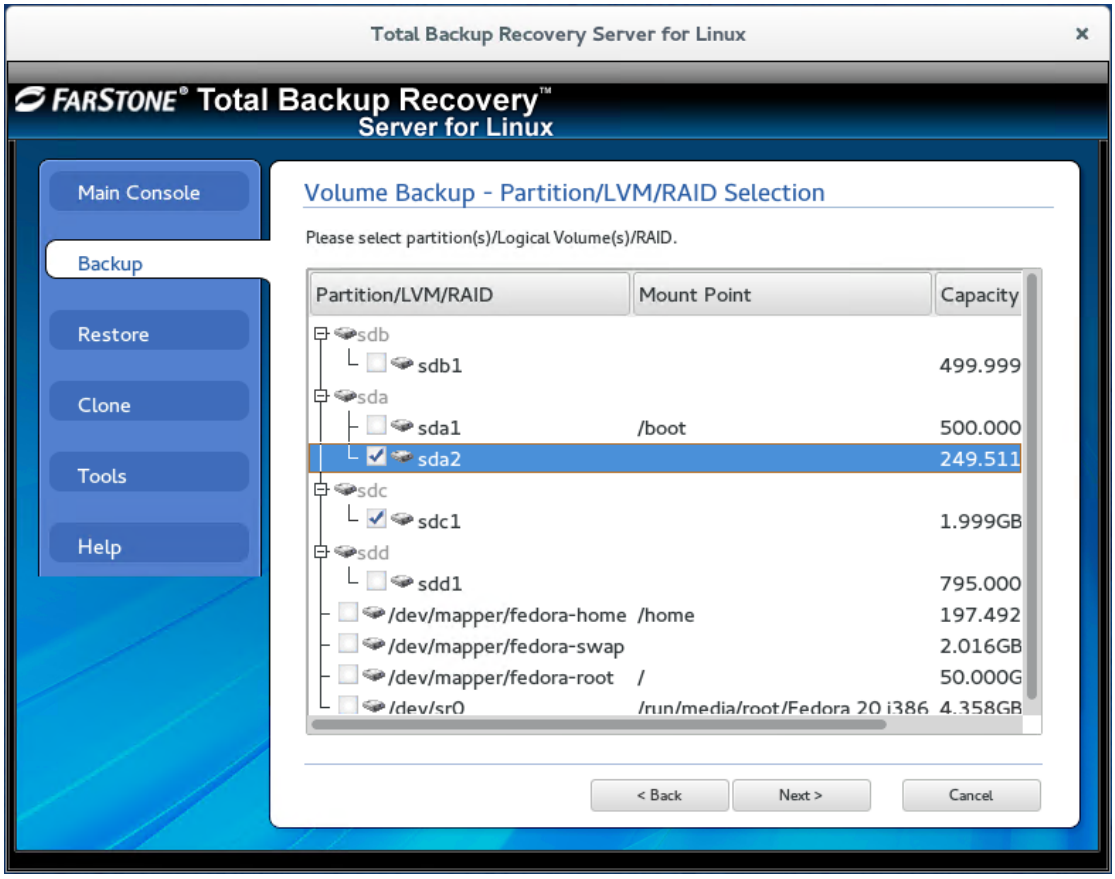
Click Next to continue backup progress.

3. **Advanced** – please refer to 5.3.

4. Click **Next** to verify the information of the backup job before backup progress begins.

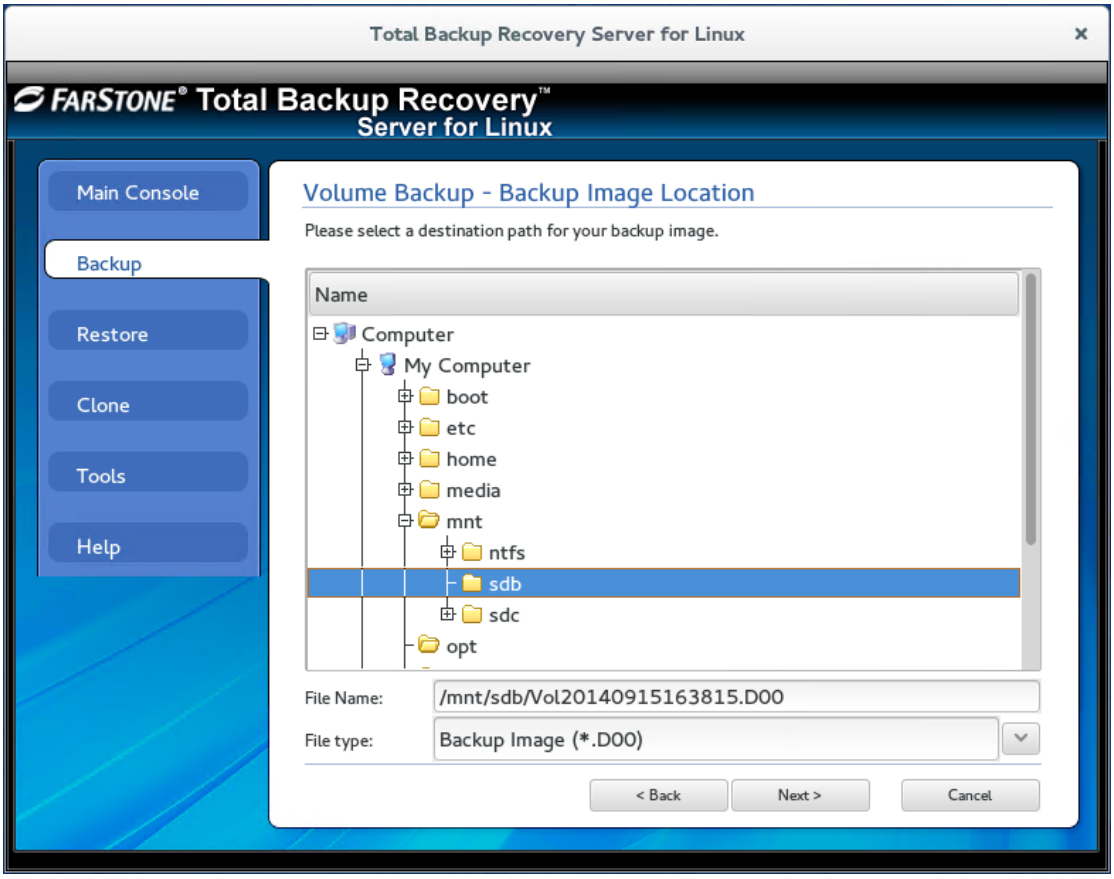
5.1.2 Schedule Backup

1. Choose backup source
After entering Schedule Backup entry, you need first check the volume/LVM to be backed up.



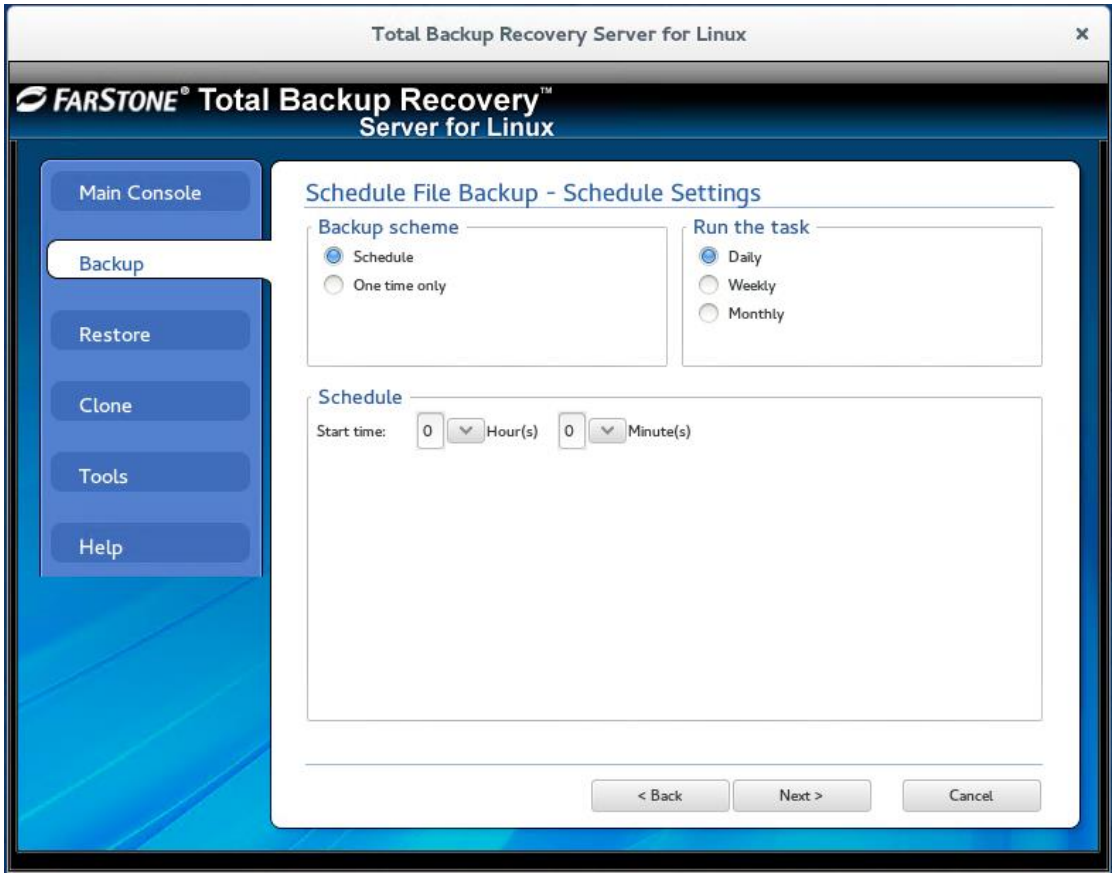
2. Set backup destination

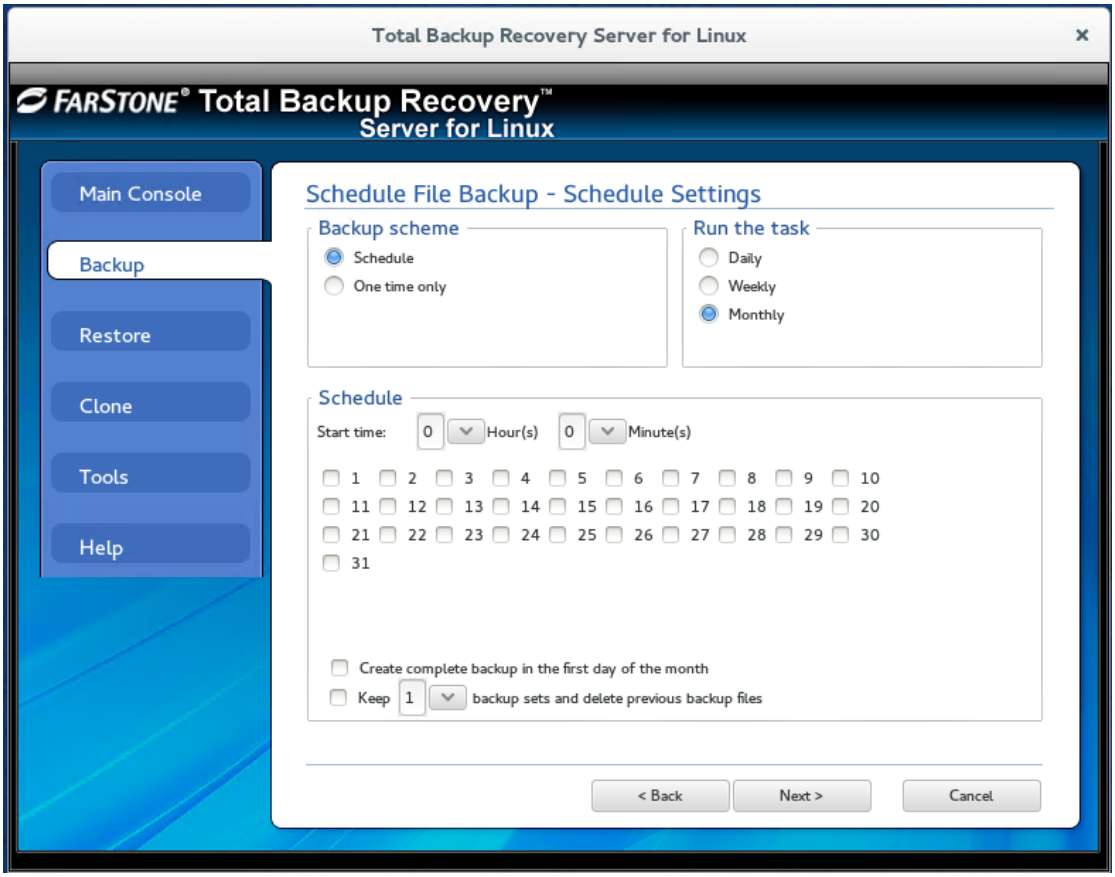
If you choose a folder, we'll save scheduled backup images into the folder; if you choose an existing backup image, then we'll create incremental backup files based on the complete backup image.



3. Set Schedule details

You can set your backup job run only once, or run multiple times according to your Daily/Weekly/Monthly settings. For schedule backup, by default, only in the first time your backup file will be complete backup, and the following backups will all be incremental ones.


Total Backup Recovery Server for Linux
FARSTONE® Total Backup Recovery™
Server for Linux
Main Console
Backup
Restore
Clone
Tools
Help
Schedule File Backup - Schedule Settings
Backup scheme
Schedule
One time only
Run the task
Daily
Weekly
Monthly
Schedule
Start time:
0
Hour(s)
0
Minute(s)
< Back
Next >
Cancel


Total Backup Recovery Server for Linux
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Main Console
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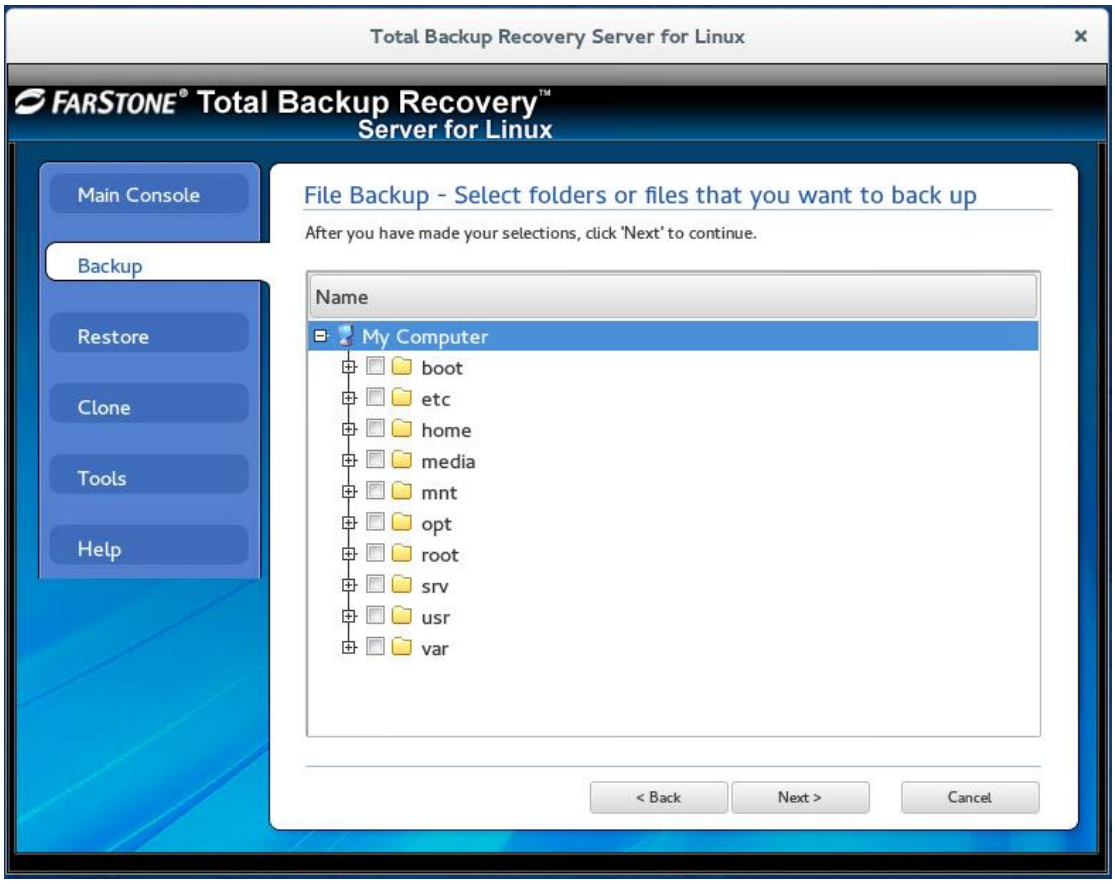
Tools
Help
Schedule File Backup - Schedule Settings
Backup scheme
Schedule
One time only
Run the task
Daily
Weekly
Monthly
Schedule
Start time:
0
Hour(s)
0
Minute(s)
1 2 3 4 5 6 7 8 9 10
11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30
31
Create complete backup in the first day of the month
Keep
1
backup sets and delete previous backup files
< Back
Next >
Cancel

If you want to have **quota management**, please check "**Keep [X] backup sets and delete previous backup files**". This option is useful when you only have limited storage capacity, because we only keep X month/week backup files for your schedule backup. For example, you choose "Monthly" and keep 3 backup sets, so you'll have only three month's backup data.
If you choose "Create complete backup in the first day of the month/week", then we'll automatically create complete backup in the first day of a month/week, and create incremental backup in the following days.
After finishing schedule settings, click **Next**, if you don't choose a complete backup image file, then we'll create a complete backup right now.

5.2 File Backup

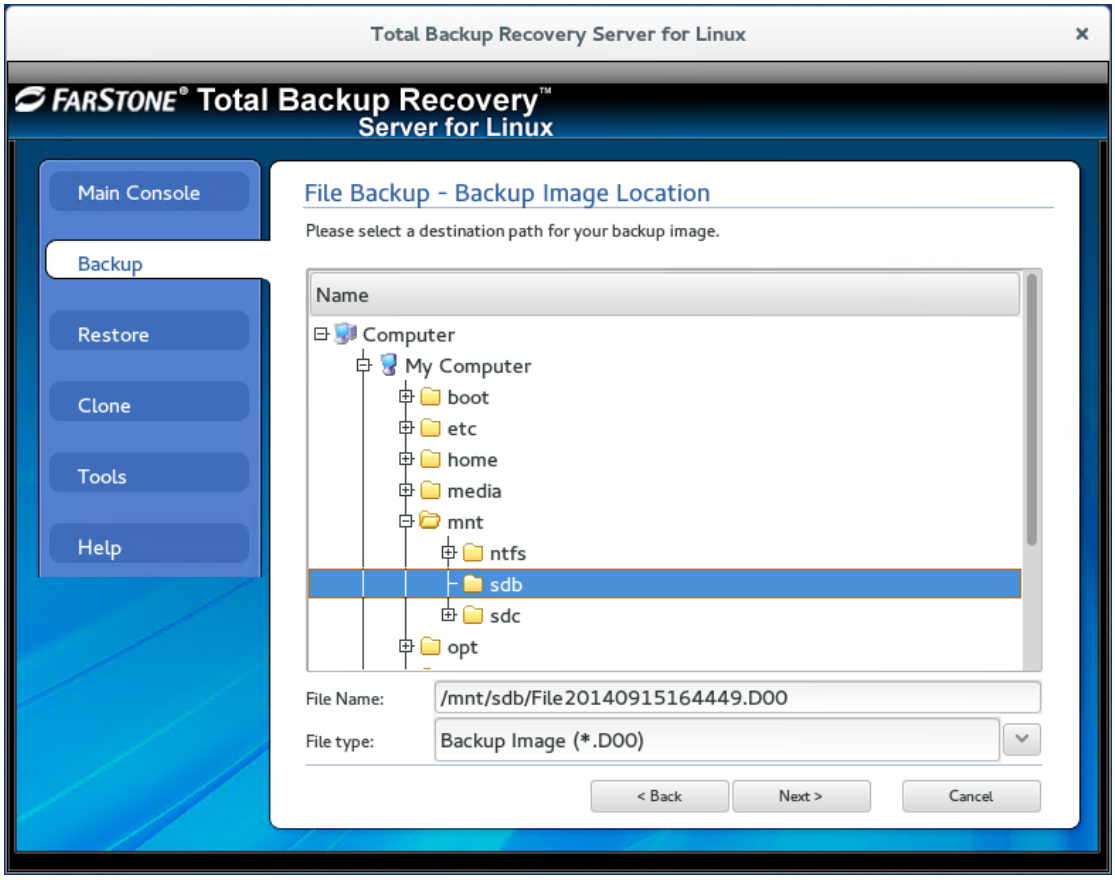
Click **Backup** on the left column, and then select **File Backup** at **Source Type** column, thereafter, choose **Backup Now** and **Schedule Backup** at **Backup Type** column on your own need.

Select folders or files that you want to backup from the list (as the picture shows below). You can click "+" to select subfolders or files in subfolders.



In the next step, a path will be automatically generated according to current time. Or

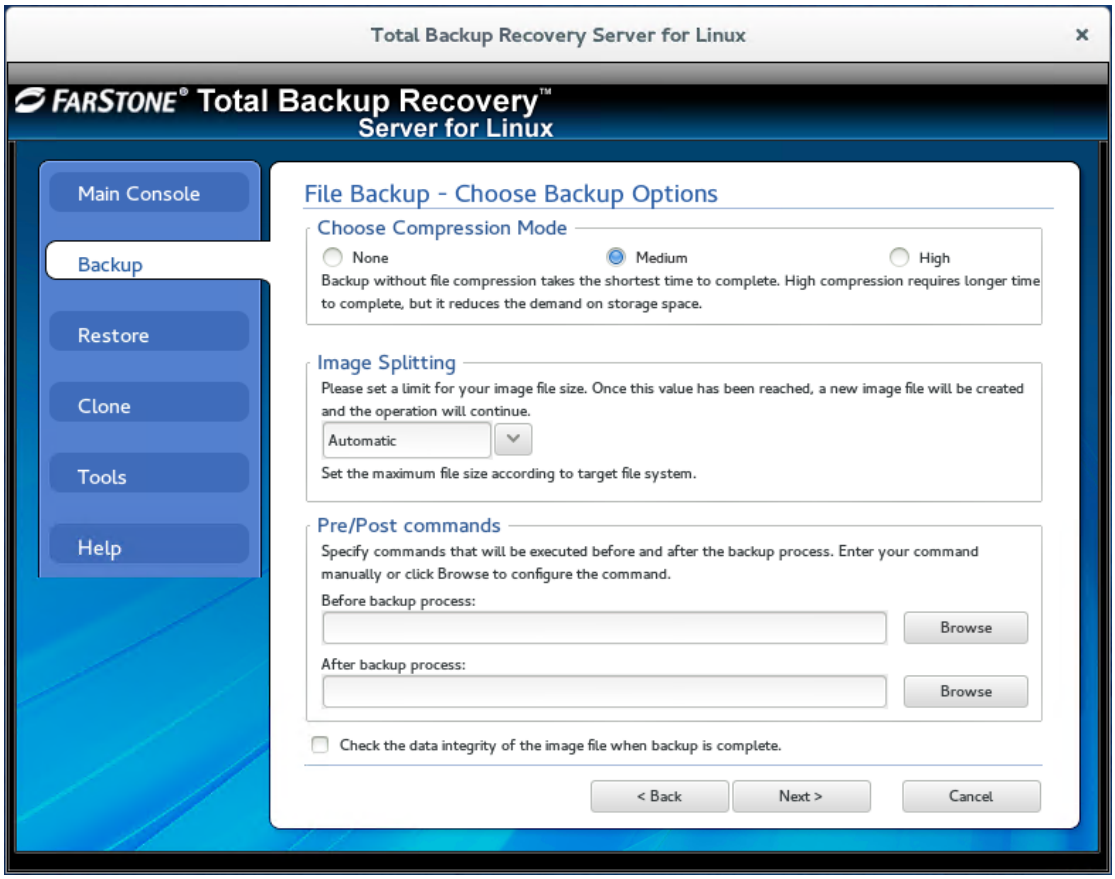
you may change it.



Click **Next** to continue. Then choose backup options, looking up to the detailed settings please refer to 5.3.

Click **Next** to verify the information of the backup job before backup progress begins.

5.3 Advanced


Total Backup Recovery Server for Linux
FARSTONE® Total Backup Recovery™
Server for Linux
Main Console
Backup
Restore
Clone
Tools
Help
File Backup - Choose Backup Options
Choose Compression Mode
None
Medium
High
Backup without file compression takes the shortest time to complete. High compression requires longer time to complete, but it reduces the demand on storage space.
Image Splitting
Please set a limit for your image file size. Once this value has been reached, a new image file will be created and the operation will continue.
Automatic
Set the maximum file size according to target file system.
Pre/Post commands
Specify commands that will be executed before and after the backup process. Enter your command manually or click Browse to configure the command.
Before backup process:
Browse
After backup process:
Browse
Check the data integrity of the image file when backup is complete.
< Back
Next >
Cancel

1. **Choose a Compression Mode:** Generally, it is recommended that you use the default Medium compression mode. You might want to select High compression for removable media to reduce the number of blank disks required.

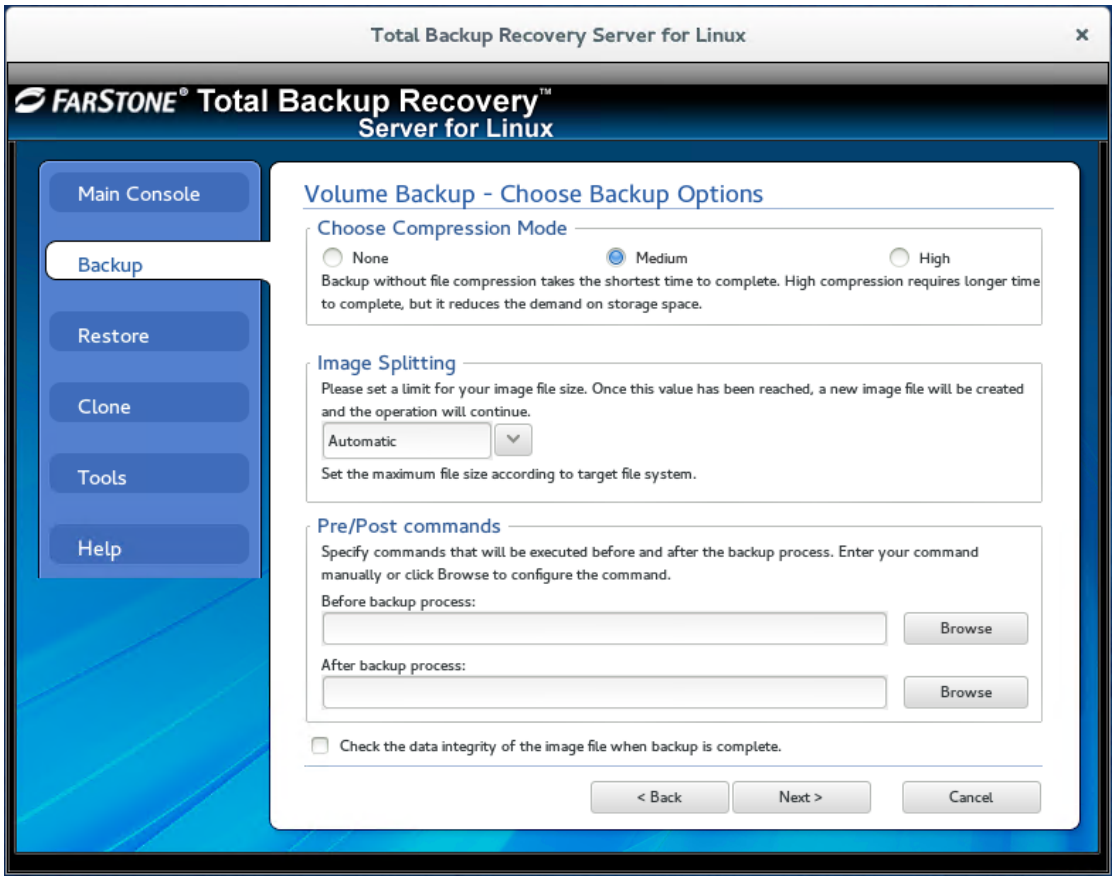
2. **Image Splitting:** Image splitting divides your backup image file into several files in order to be compatible to some Linux File Size limitation, or to facilitate to move to other device such as USB or CD/DVD.

3. **Pre/Post commands:** Pre/Post command is doing some preparation or winding up jobs for your backup process. It's mostly used to back up files related to data bases.

Database servers, such as MySQL, prove to be troublesome to backup, partially due to open files/indexes and rapid data changes.

Therefore many system administrators prefer to suspend the database at the backup (capturing the Snapshot) moment. To ensure that the database will be ready to access immediately after recovery, the administrator must ensure completion of all transactions before the backup process starts. Once the backup process starts, you can resume server operations. It is not necessary to suspend the applications for the duration of the imaging process. The transactions completion can be ensured with executing scripts that stop the appropriate services and automatically resume them after data capture.

Create scripts in any text editor, and then browse to the script file. Or just enter a single command along with its arguments and working directory. If you have no idea about how to stop or restart a Linux database, please send e-mail to us.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Main Console
Backup
Restore
Clone
Tools
Help
Volume Backup - Choose Backup Options
Choose Compression Mode
None
Medium
High
Backup without file compression takes the shortest time to complete. High compression requires longer time to complete, but it reduces the demand on storage space.
Image Splitting
Please set a limit for your image file size. Once this value has been reached, a new image file will be created and the operation will continue.
Automatic
Set the maximum file size according to target file system.
Pre/Post commands
Specify commands that will be executed before and after the backup process. Enter your command manually or click Browse to configure the command.
Before backup process:
Browse
After backup process:
Browse
Check the data integrity of the image file when backup is complete.
< Back
Next >
Cancel

In above Stop_mysql script, you can enter command line "/etc/init.d/mysql stop" to stop mysql service before backup; enter "/etc/init.d/mysql start" to restart mysal service after backup.

5.4 Backup Jobs

Here displays detailed information of backup jobs.

Backup Now: Click **Backup Now** to incrementally back up your chosen file or disk image immediately.

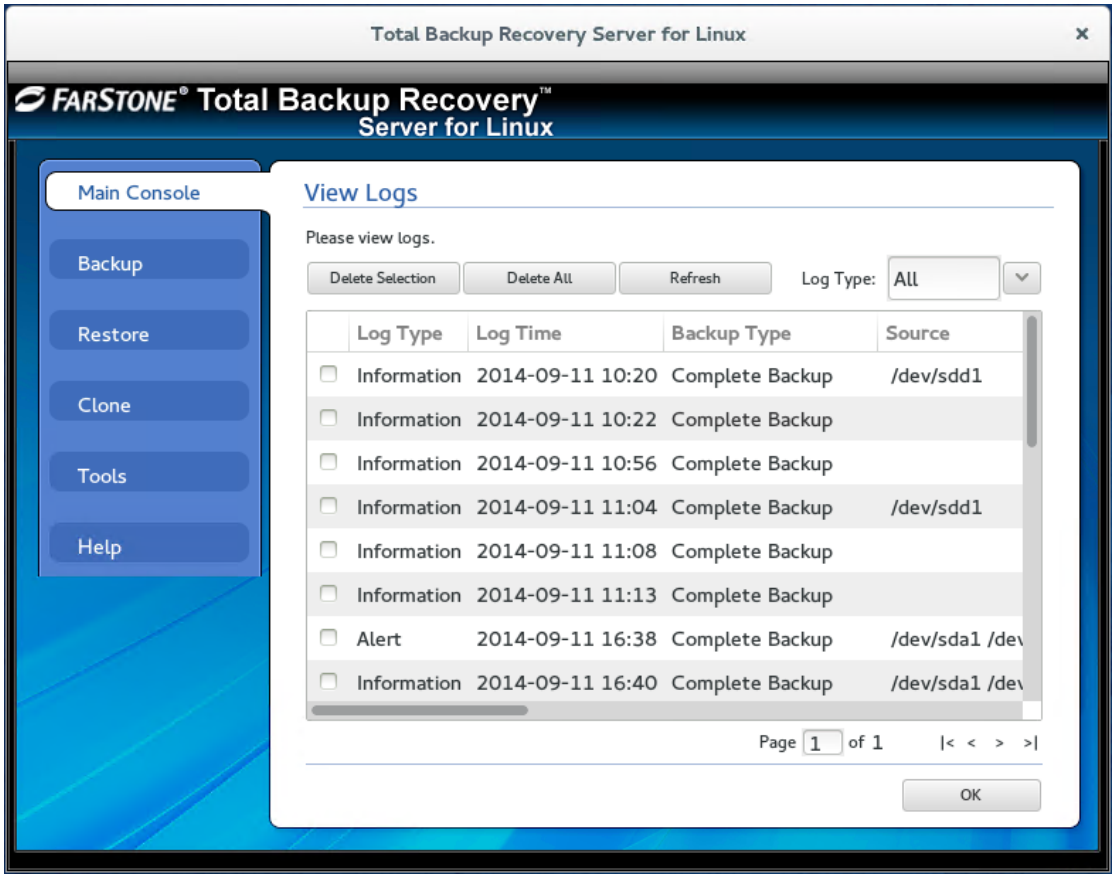
Delete: Click here to delete chosen image.

New Job: Click here to create a new backup job.

Restore: Click **Restore** to restore your backup file or disk image immediately.

5.5 View Logs

Choose **View Logs** in the main console to check logs.
You can choose to delete them all or delete the selected.
Click the downward menu of **Log Type** to choose one type or all types for check.
In all log types, "Error" type are the most important one. It only happens when backup or restoration operation failed.



5.6 Backup with Command Line (Text Mode)

Please refer to below operation if you need to back up with command line:
Login with root account, and then enter text mode or enter Terminal and type below commands: #/usr/TBRLinux/tbrlinuxCMD

Below message shows:
Usage: tbrlinuxCMD [OPTION...] [DEVICE]...

Examples:
tbrlinuxCMD -l
List system device.
tbrlinuxCMD -c -C 2 -S 650 -f /test.D00 /dev/sda1 # Create new base backup now.

tbrlinuxCMD -s -W 1,5 -T 12:00 -f /test.D00 # Set schedule for exist backup.

tbrlinuxCMD -b -C 2 -S 650 -W 1,5 -T 12:00 -f /test.D00 /dev/sda1 # Create new base backup and set schedule.

Main operation mode:

```
-l, --list              list the volumes of device
-c, --create            create a new base backup
-s, --schedule          set schedule for a exist backup
-b, --background set schedule for a new backup
-h, --help              give this help list
```

Base backup directory selection:

```
-f, --file <dirctory>           use the directory of base backup
```

Handling of create backup attributes:

```
-C, --compression <comp>    select <comp> compression
                                    Compressors available:
                                    1, no compression
                                    2, medium compression (default)
                                    3, high compression
-S, --split <size>              select <size> split
                                    Sizes available:
                                    0, automatic (default)
                                    650, 650MB split
                                    700, 700MB split
                                    2000, 2000MB split
```

Handling of schedule attributes:

```
-W, --week    <1...7>       day of week (1..7); 1 is Monday
                                1 (default)
-M, --month <1...31>    day of month (1..31)
                                1 (default)
-T, --time    <HH:MM>       24-hour hour and minute; same as HH:MM
                                2:0 (default)
-N, --number <size>       keep base backup sets number
```

Some Examples of backup

In below example, backup-able device was listed first, then create a base backup at "/dev/sda1" device and set a schedule.

1. List current backup-able device:

```
#    tbrlinuxCMD –l
```

2. Create a new base backup immediately

```
# tbrlinuxCMD -c -C 2 -S 650 -f /test.D00 /dev/sda1
```

3. Set an incremental schedule backup at 12 O'clock every Monday and Friday.
tbrlinuxCMD -s -W 1,5 -T 12:00 -f /test.D00
4. Operate an incremental backup of test.D00 at 12 O'clock every Monday and Friday. For the first scheduled middle-compressed base backup, sda1 device will be created and volume as 650MB.
tbrlinuxCMD -b -C 2 -S 650 -W 1,5 -T 12:00 -f /test.D00 /dev/sda1

Keep assigned fraction

If both base and incremental backup are needed, please add parameter "-b"

Chapter 6 Restore File/Folders

There are three ways to restore:

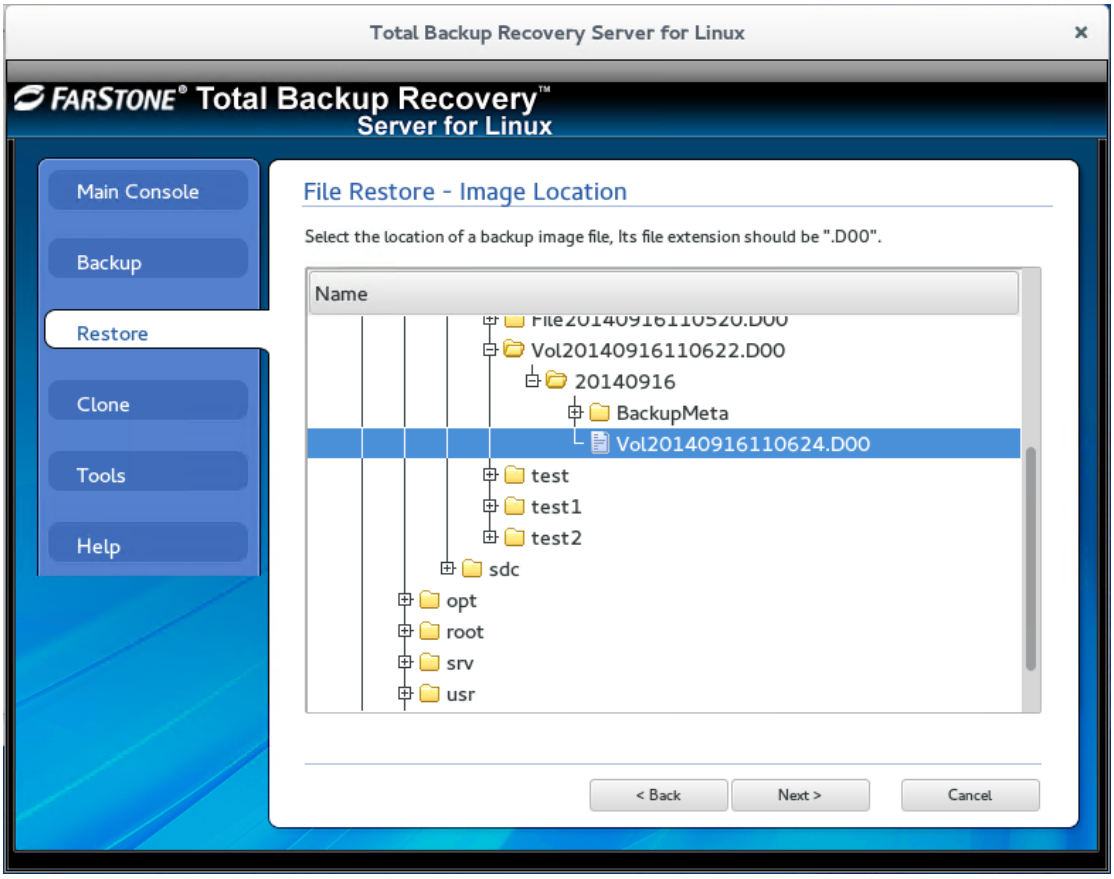
1. Restore the whole image which needs to reboot by Linux system rescue disk before restoring (refer to chapter 7: Restoring Images);

2. If your important files reside in a Volume Backup image, please load the image and then restore some important files or folders in it.

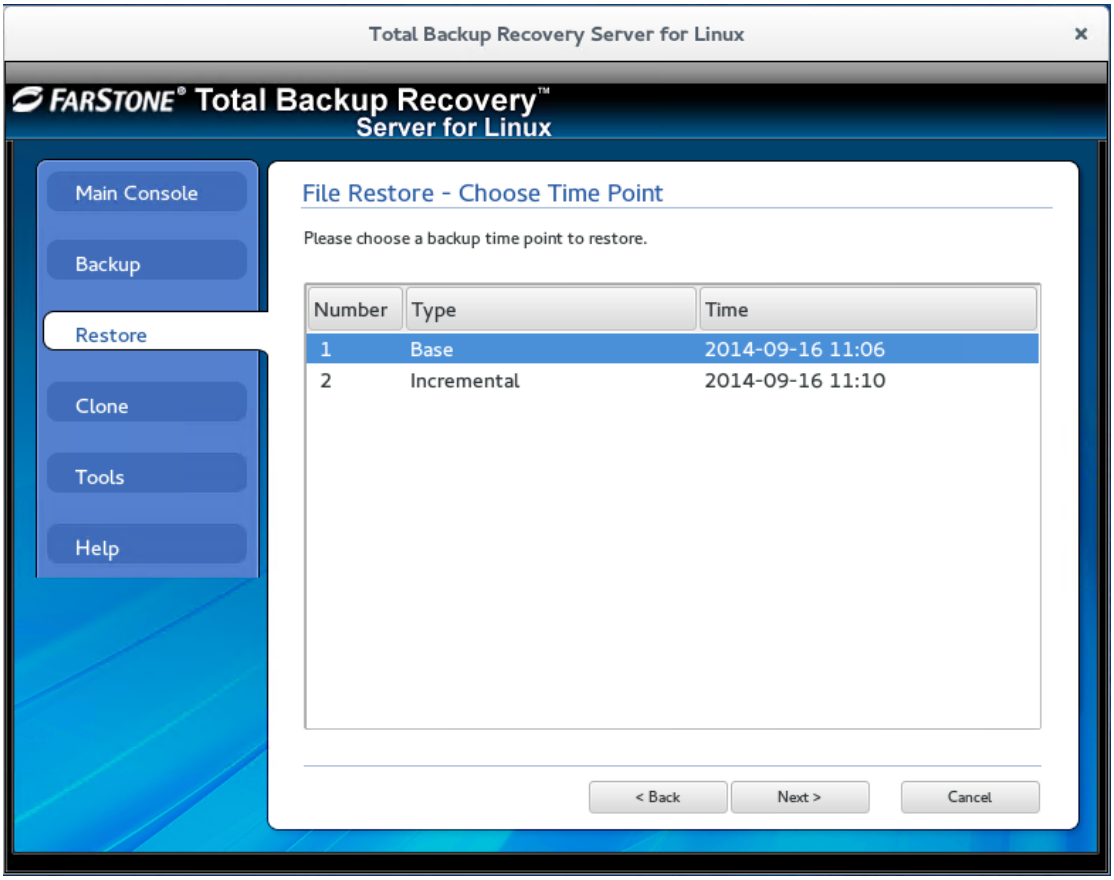
3. As for File Backup image, you need enter "Restore-File Restore", choose the backup image, and then restore all files or selected files from it.

6.1 Restore some files from Volume Backup image

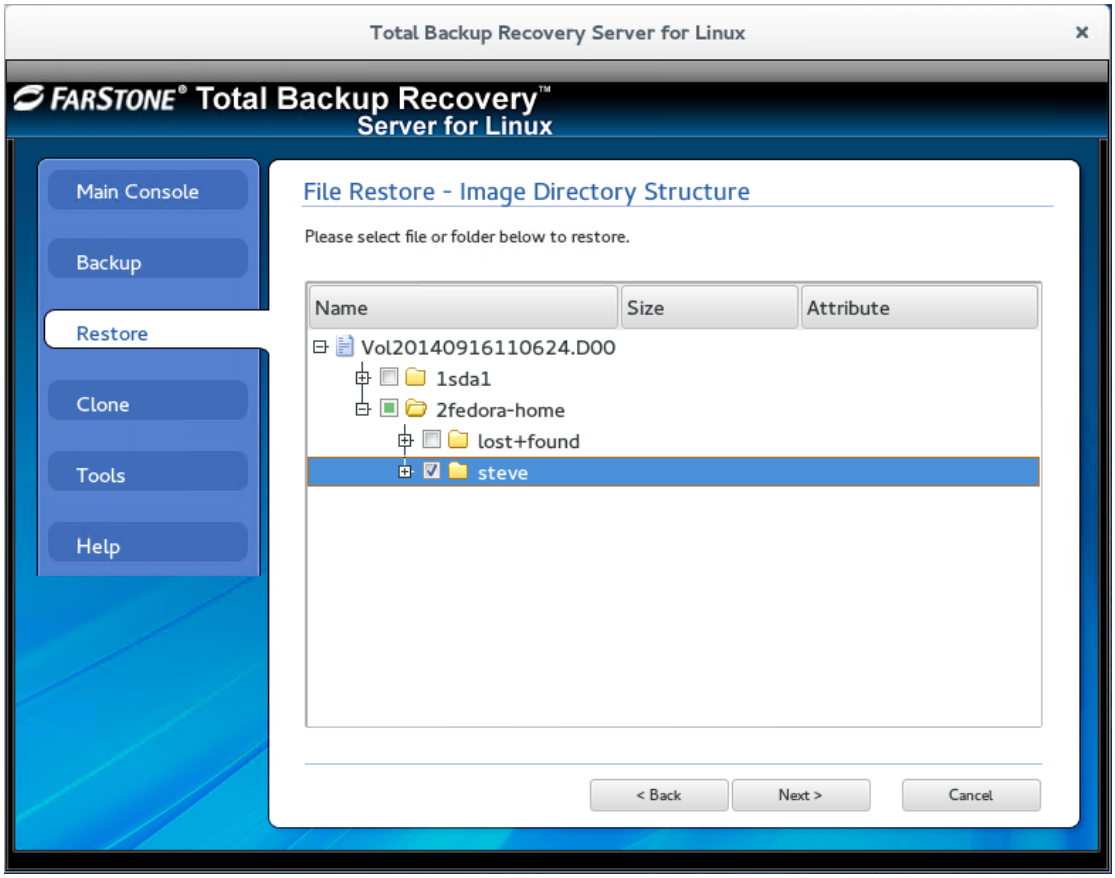
1. Click File Restore, choose the volume backup image to restore from, and then click Next.



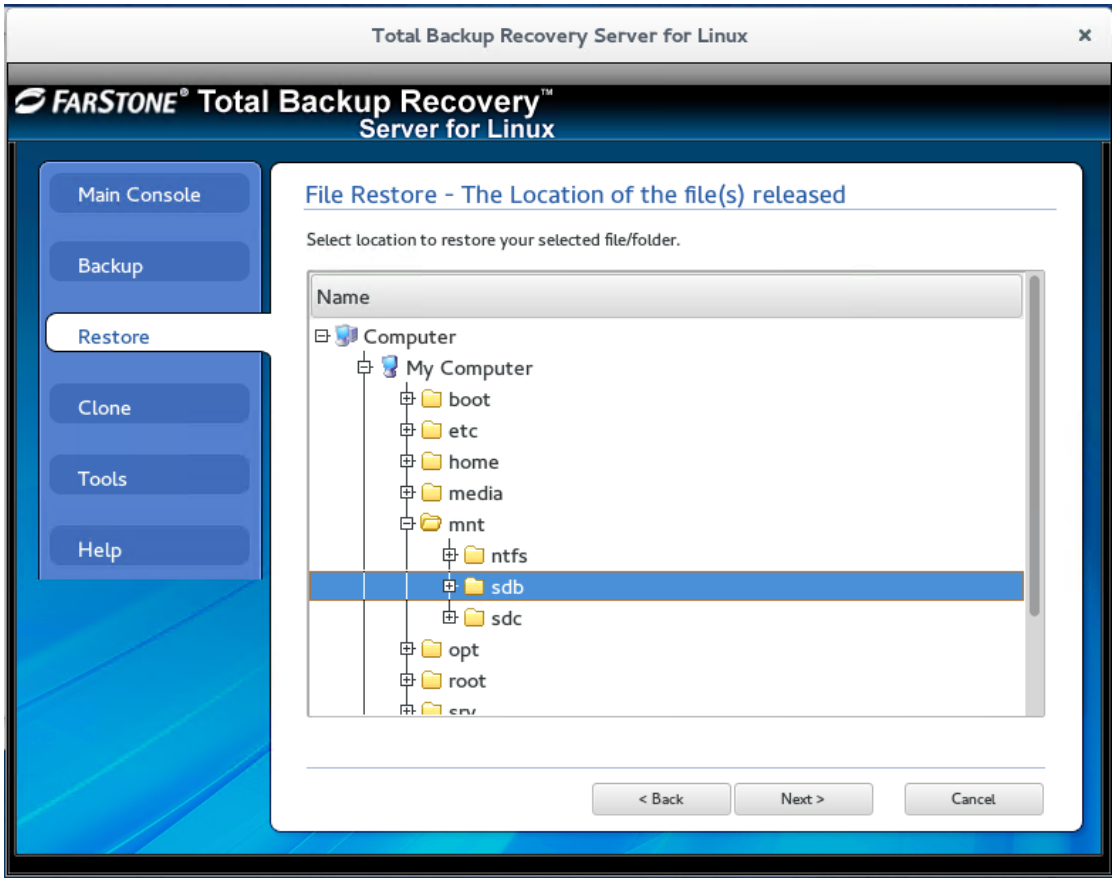
Choose a restoration point from below list.



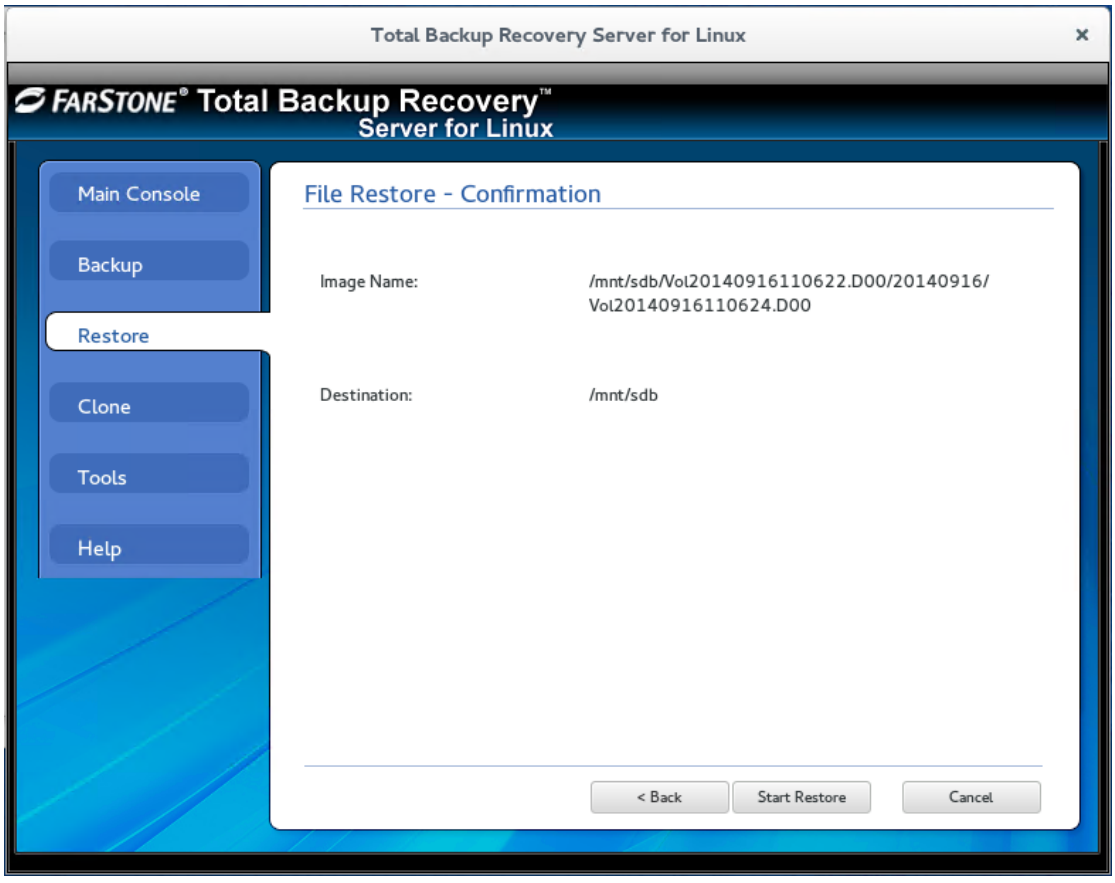
2. Check files and folders to be restored, and then click Next;



3. Choose destination for restored files and folders. If you want to restore files to the original location, please just check “Restore to original location”. And then click Next.



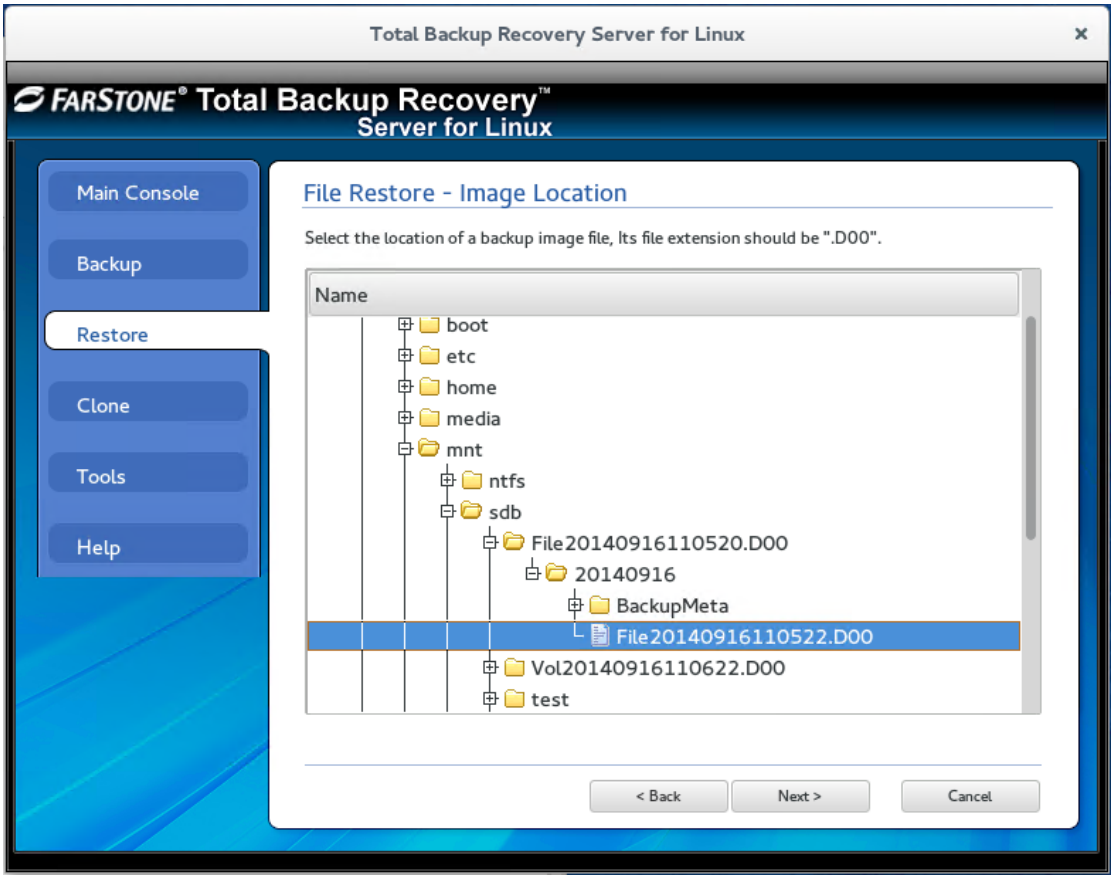
4. Confirm previous selections;



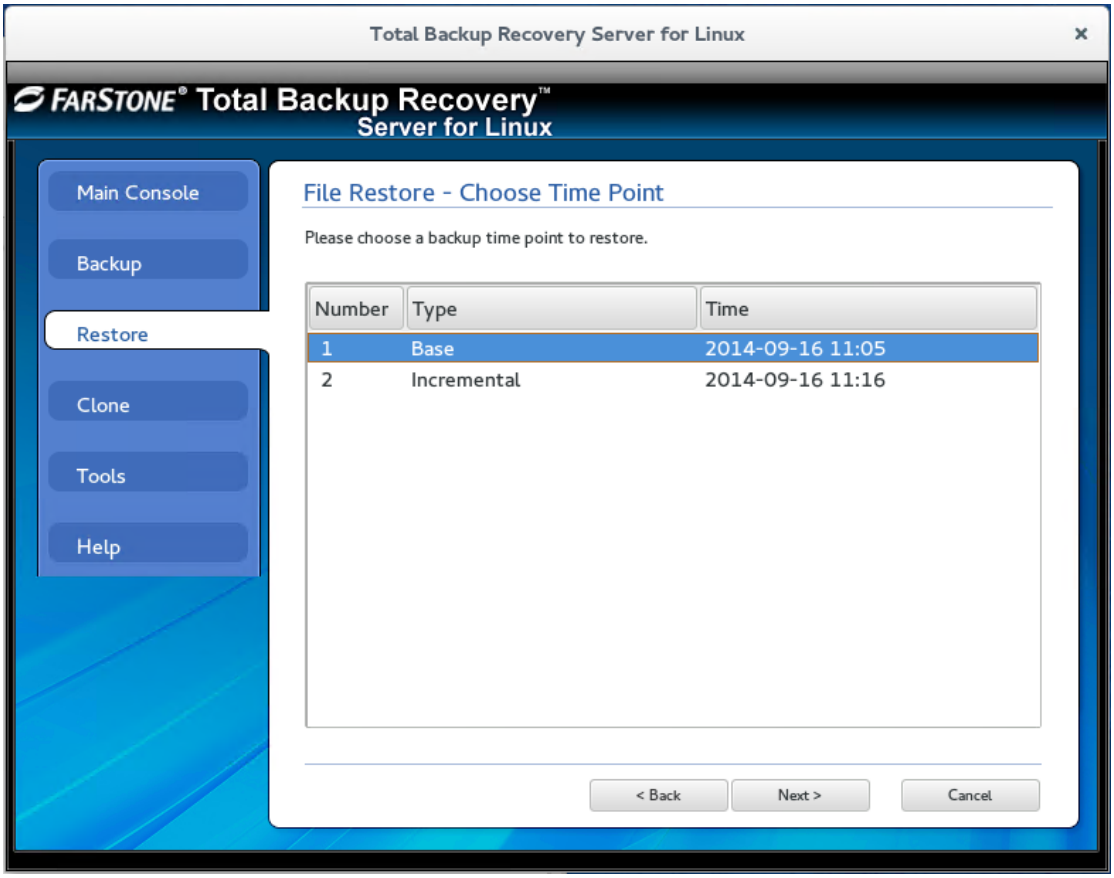
5. Begin restoration progress.

6.2 Restore files from File Backup image

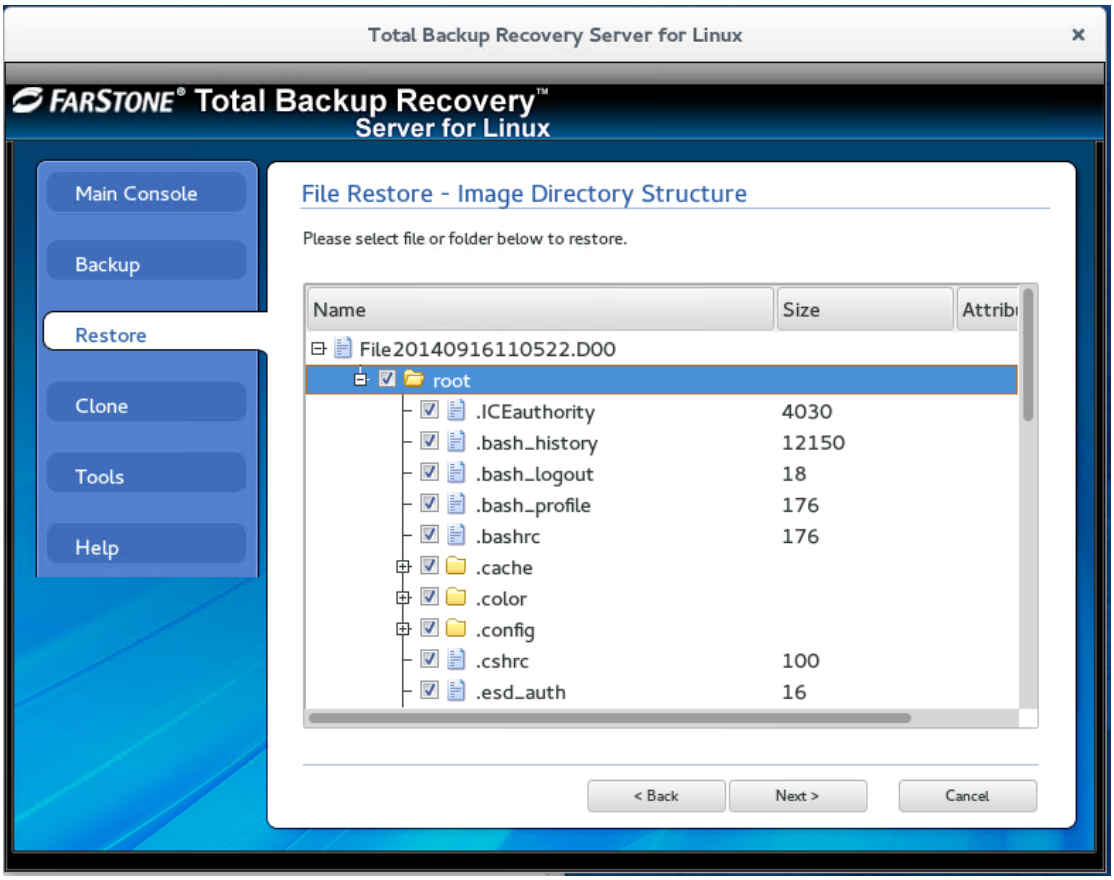
1. Click File Restore, choose the file backup image file to restore from, and then click Next.



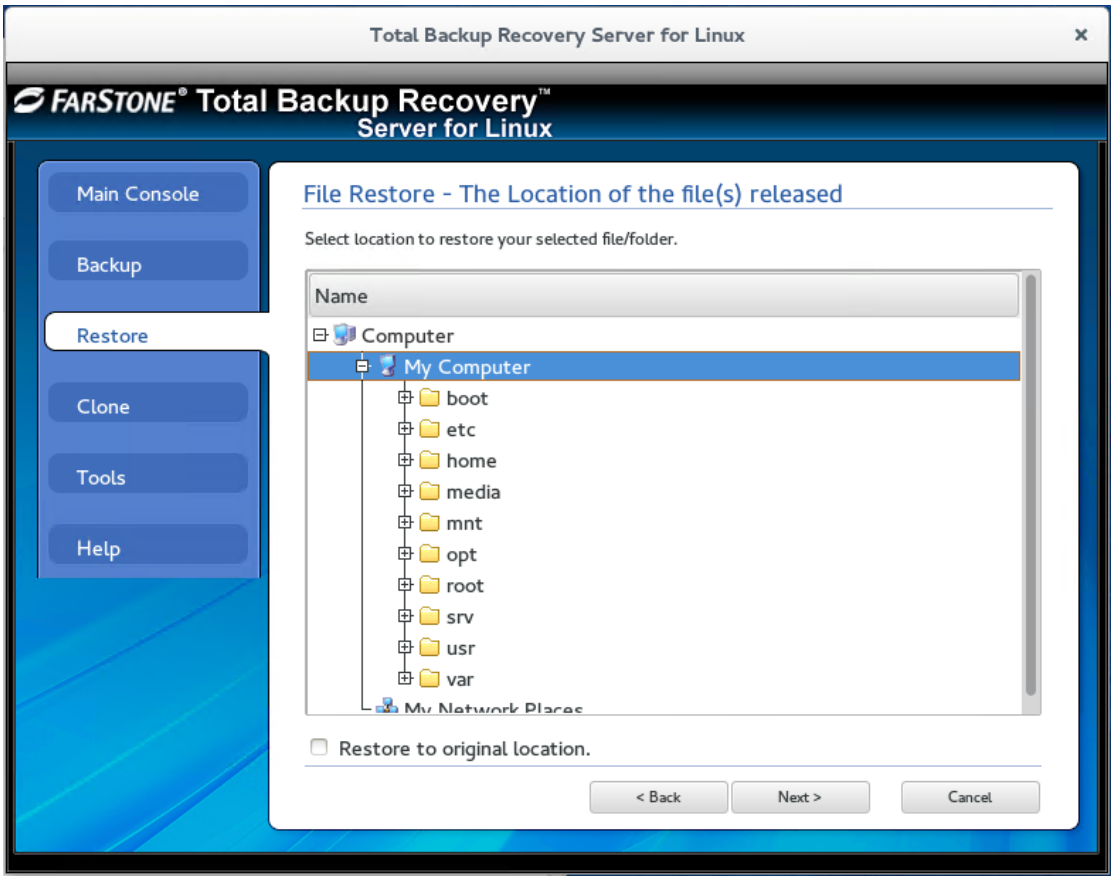
Choose a restoration point from below list.



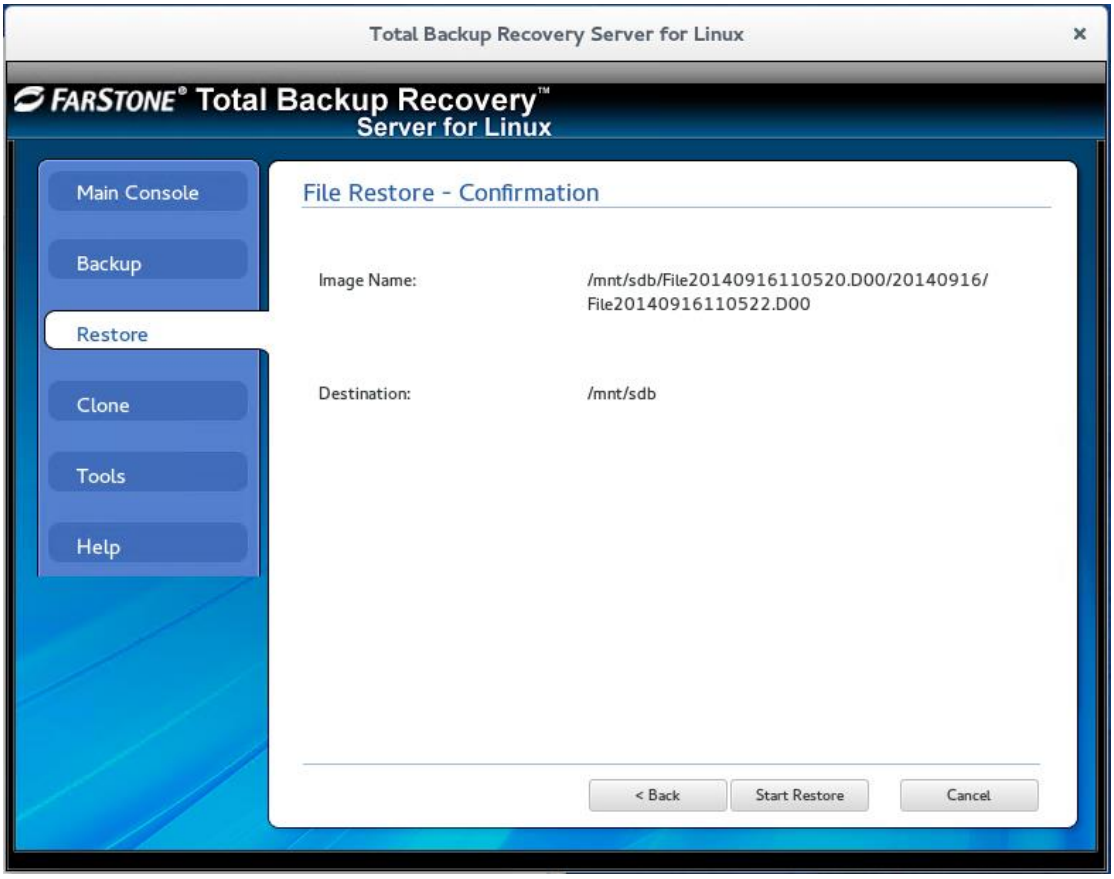
2. Check files and folders to be restored, and then click Next;



3. Choose destination for restored files and folders. If you want to restore files to the original location, please just check “Restore to original location”. And then click Next.



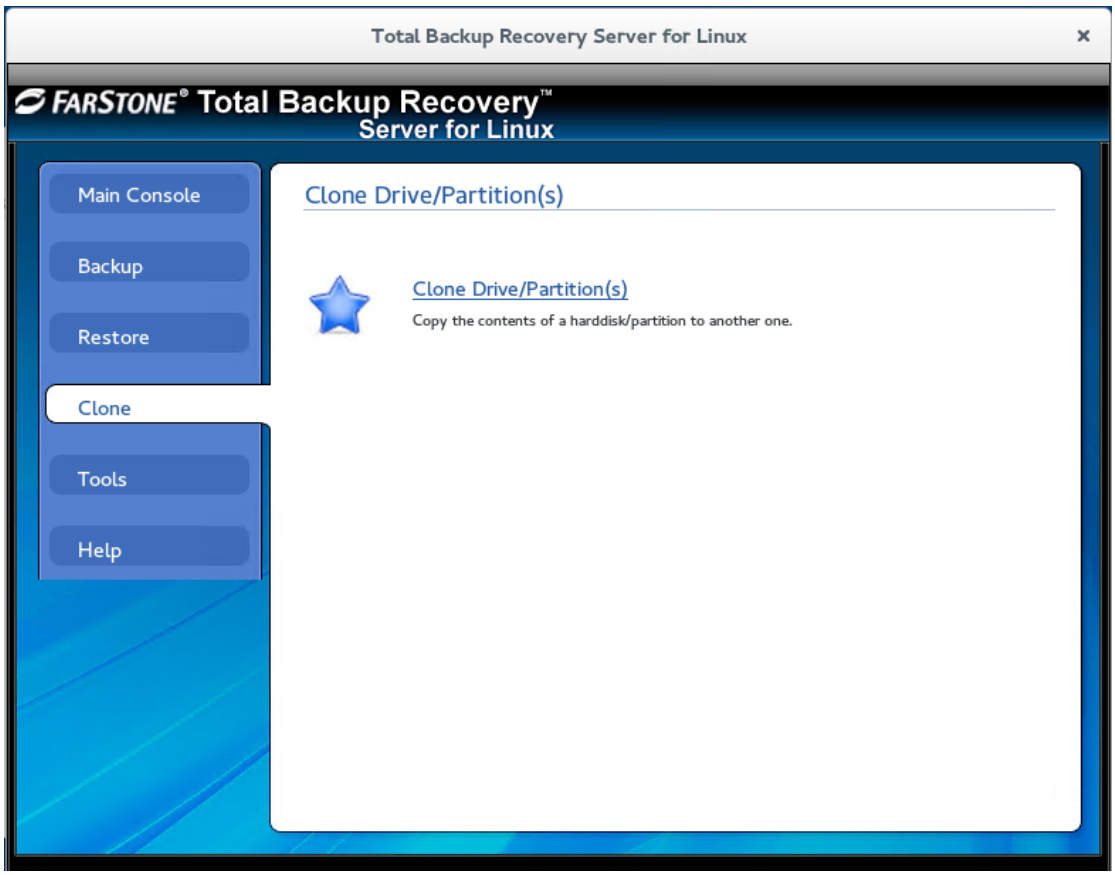
4. Confirm previous selections;



5. Begin restoration progress.

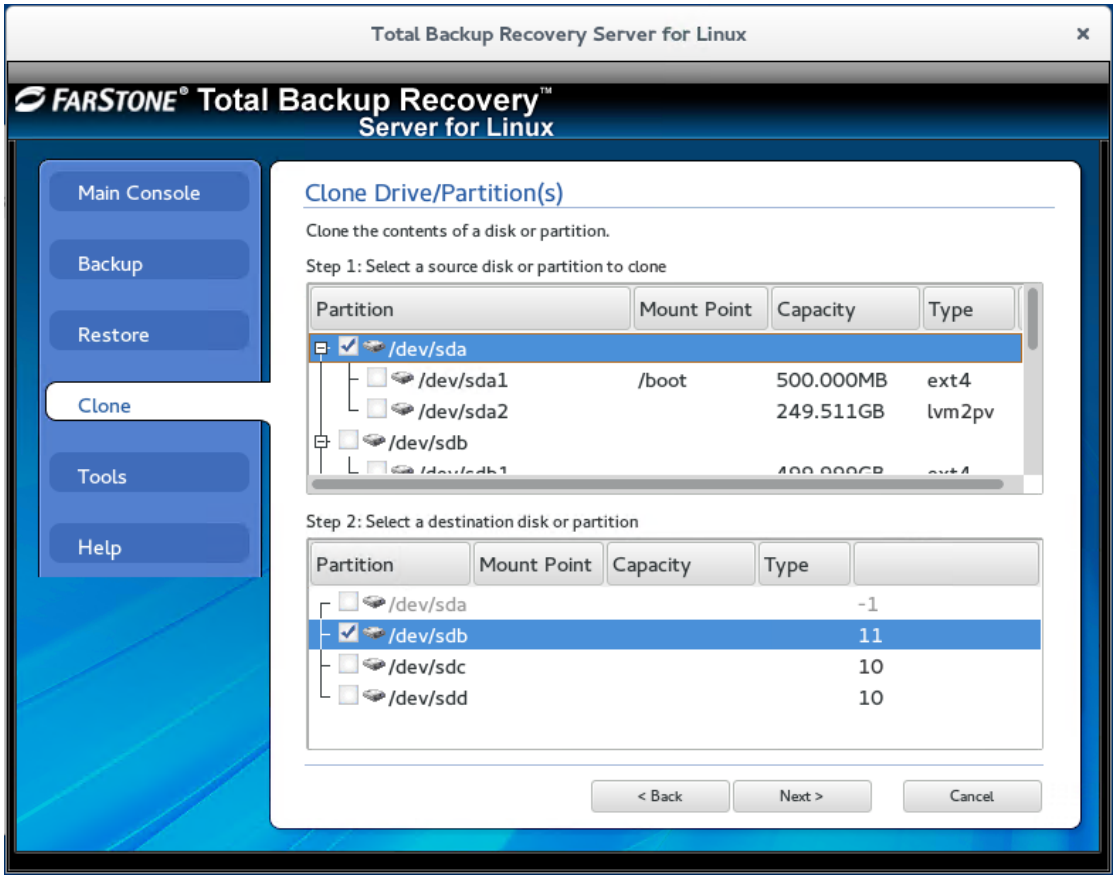
Chapter 7 Clone

Clone Drive/Partition(s) supports cloning from hard drive/partition to another hard drive/partition and from a smaller hard drive to a bigger one.

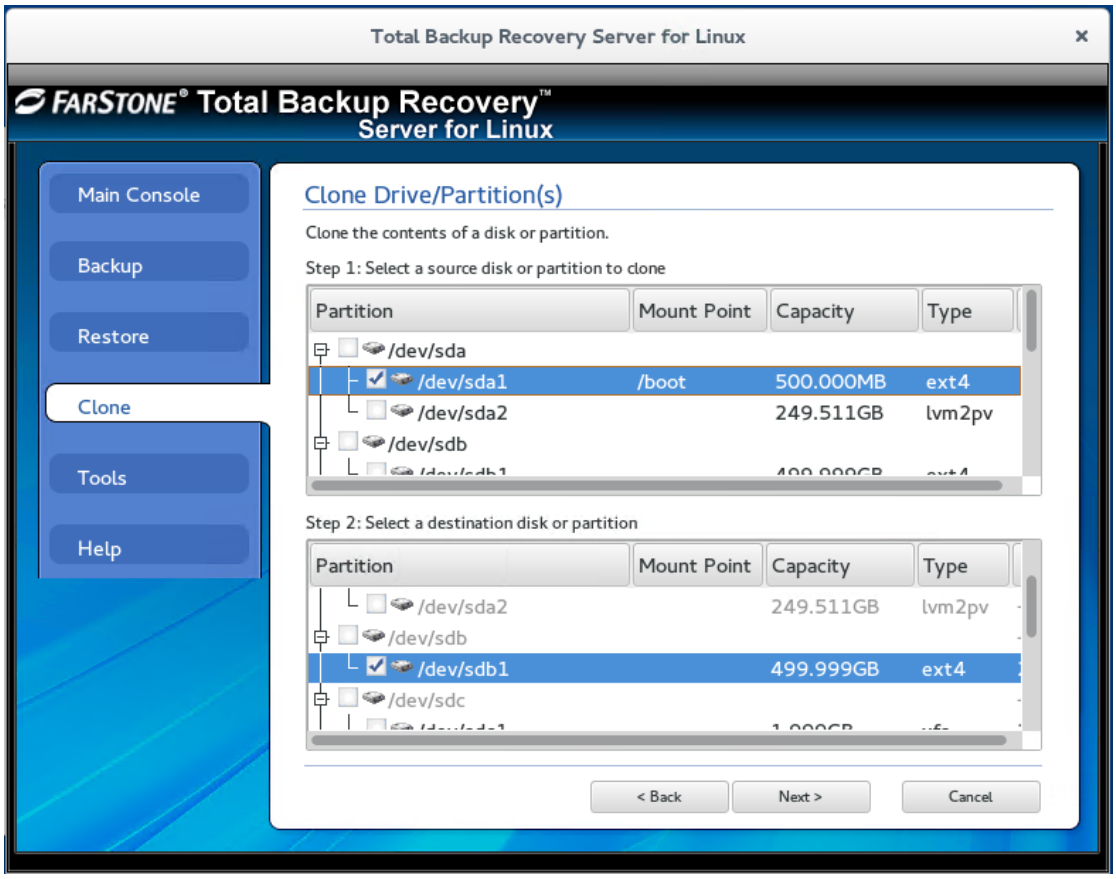


1. Clone hard drive

Select a source hard drive and destination one.

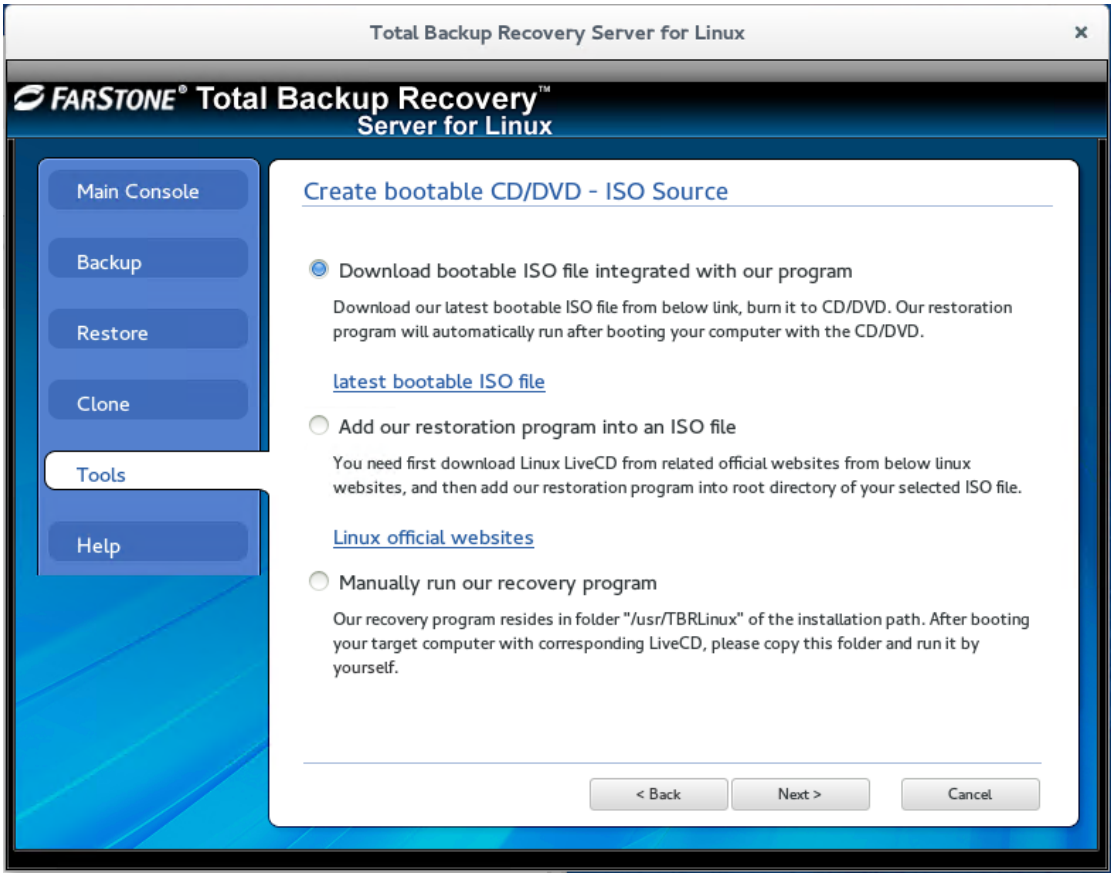


2. Clone partition



Chapter 8 Restore Images

To be compatible to different Linux OS and different hard wares, we choose the corresponding Linux LiveCD of your current Linux OS to create rescue disk. Here, corresponding means the same Linux OS version of the backup source, and the same OS type (32bit/64bit).

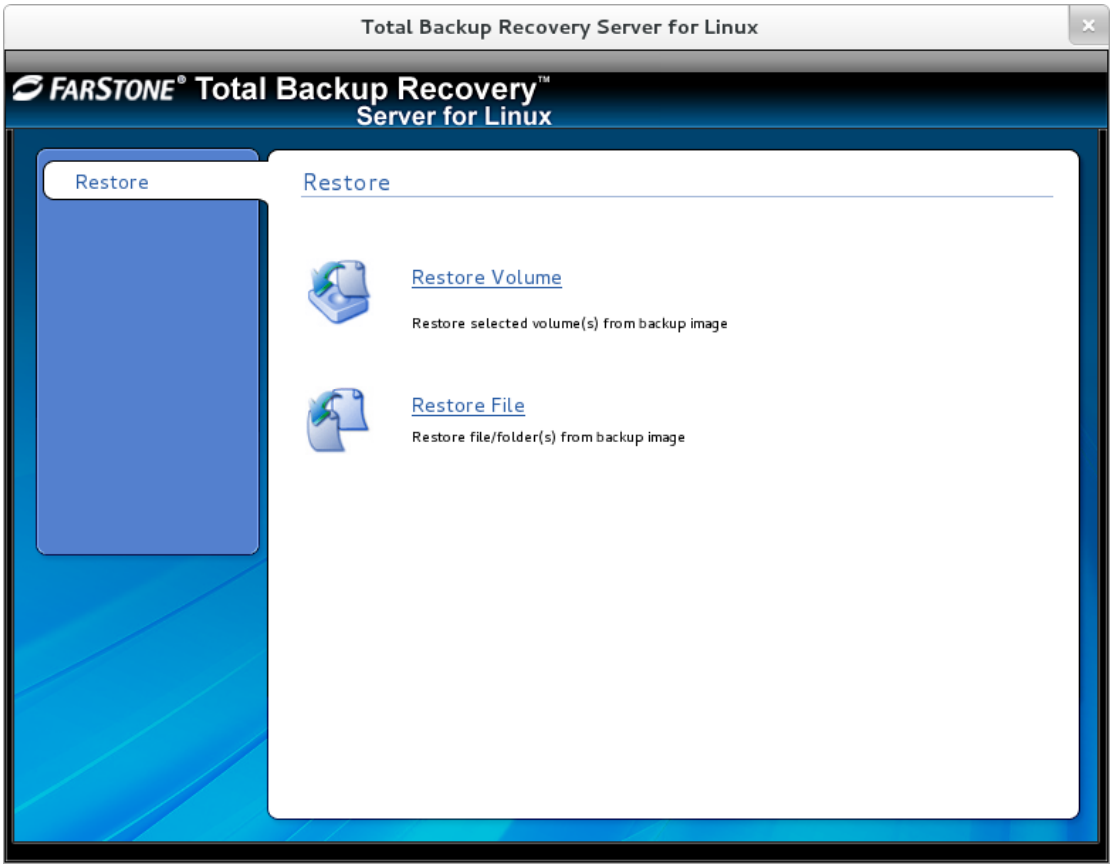

Total Backup Recovery Server for Linux
FARSTONE® Total Backup Recovery™
Server for Linux
Main Console
Backup
Restore
Clone
Tools
Help
Create bootable CD/DVD - ISO Source
Download bootable ISO file integrated with our program
Download our latest bootable ISO file from below link, burn it to CD/DVD. Our restoration program will automatically run after booting your computer with the CD/DVD.
latest bootable ISO file
Add our restoration program into an ISO file
You need first download Linux LiveCD from related official websites from below linux websites, and then add our restoration program into root directory of your selected ISO file.
Linux official websites
Manually run our recovery program
Our recovery program resides in folder "/usr/TBRLinux" of the installation path. After booting your target computer with corresponding LiveCD, please copy this folder and run it by yourself.
< Back
Next >
Cancel

You may choose three methods to create your bootable CD/DVD:

1. Download bootable ISO file integrated with our program(recommended)
2. Add our restoration program into LiveCD ISO file
3. Run command line tool to restore

8.1 Download bootable ISO file integrated with our program

Download an ISO file from FarStone website and burn it into a CD/DVD. After booting target computer with it, you can directly enter our restore UI.



8.2 Add our restoration program into an ISO file

If you don't have the Linux LiveCD, you need download it from below official Linux websites, and integrate our restoration program with it, finally burn the new ISO to a CD/DVD.

1. Based on Linux type and version of the image, please first download corresponding LiveCD from its official website. Here are download links for some popular Linux versions:

a) CentOS
http://www.centos.org/download/

b) Debian
www.debian.org/CD/http-ftp/

c) Fedora
http://download.fedoraproject.org/pub/fedora/linux/releases/

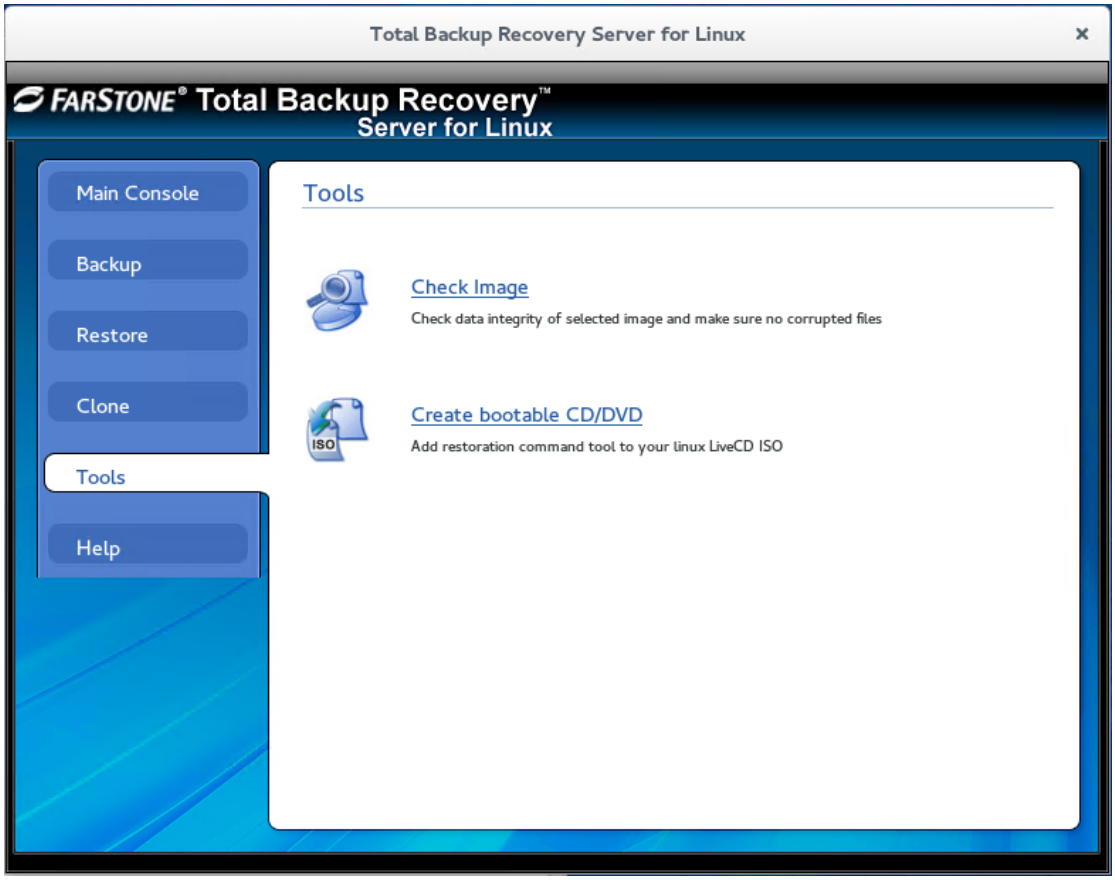
d) UBUNTU
http://www.ubuntu.com/download/desktop

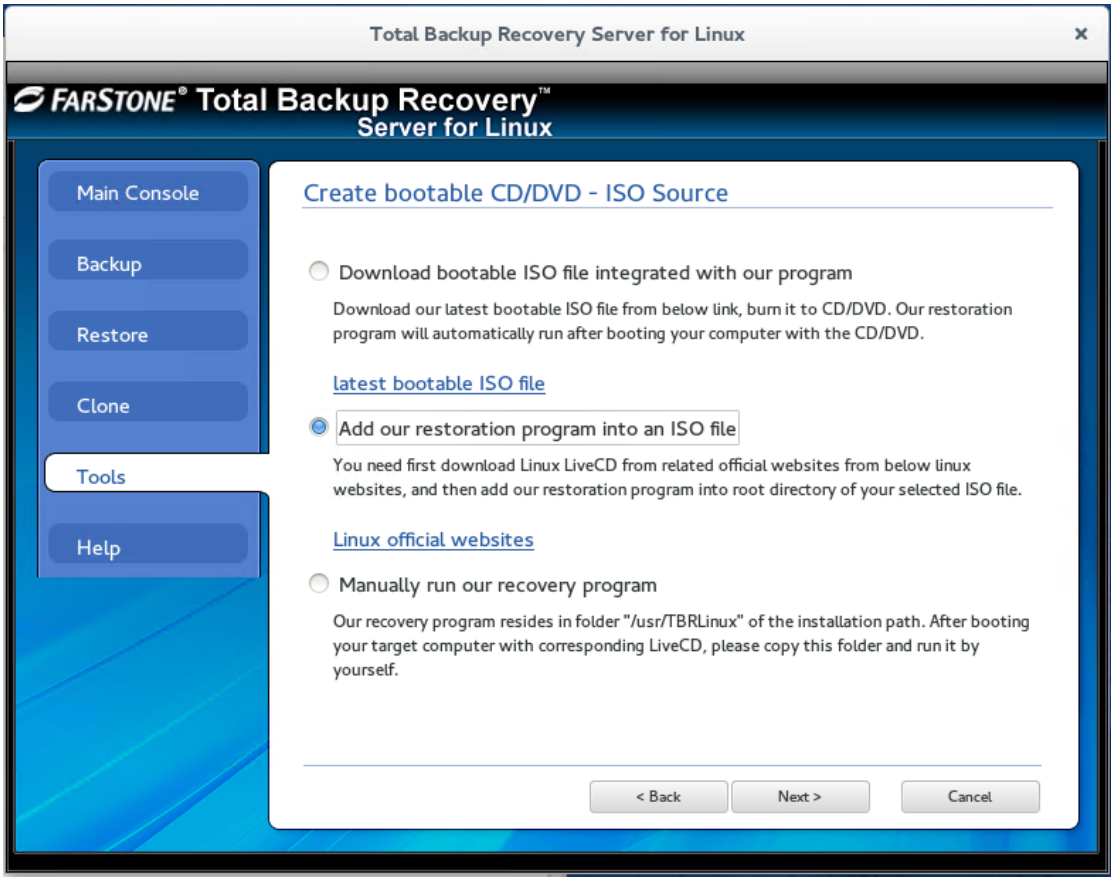
e) Open SUSE
http://software.opensuse.org/

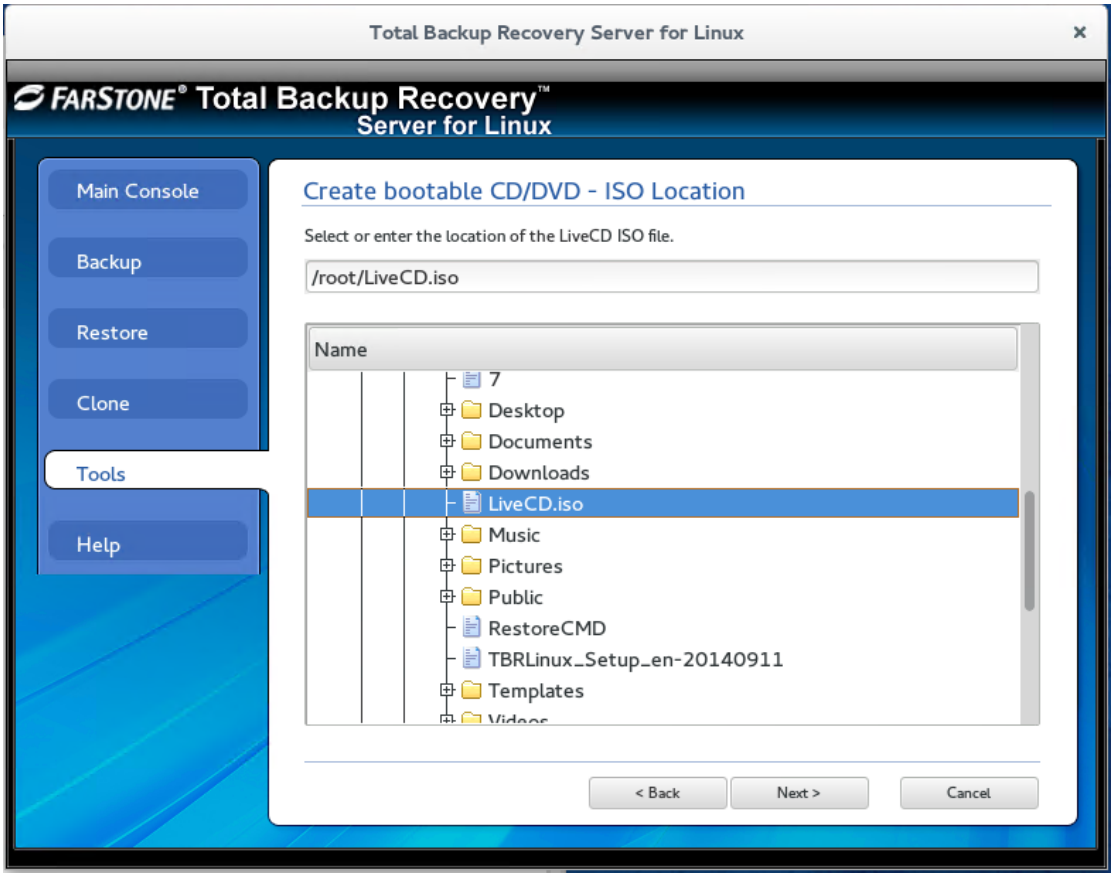
f) Redhat
https://access.redhat.com/downloads

g) Suse
https://www.suse.com/download-linux/

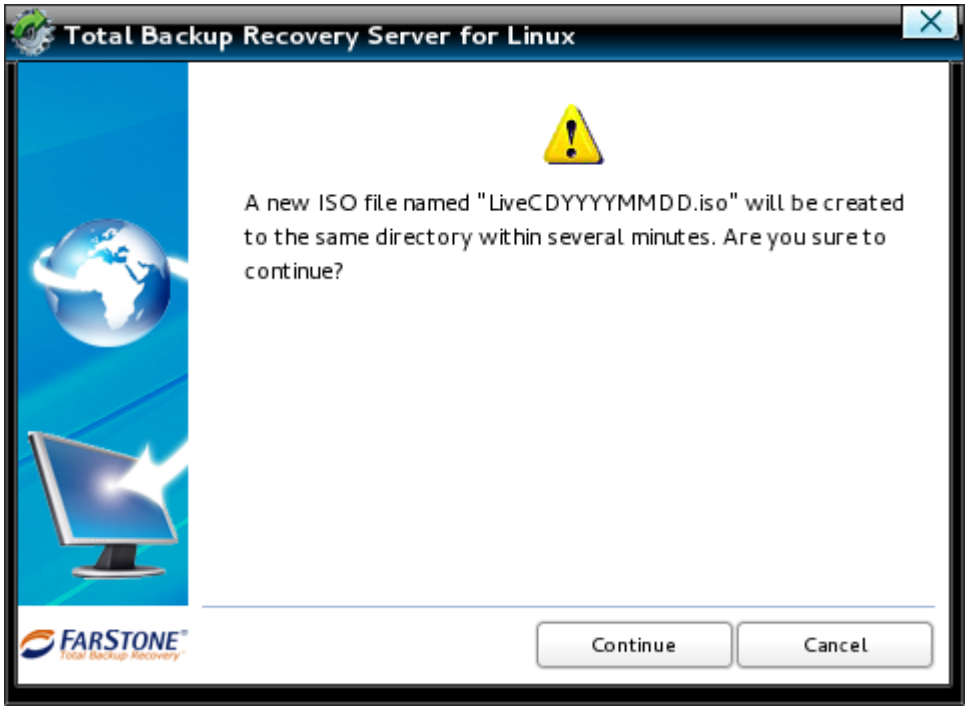
2. Select or enter the location of the LiveCD ISO file, and click Next.

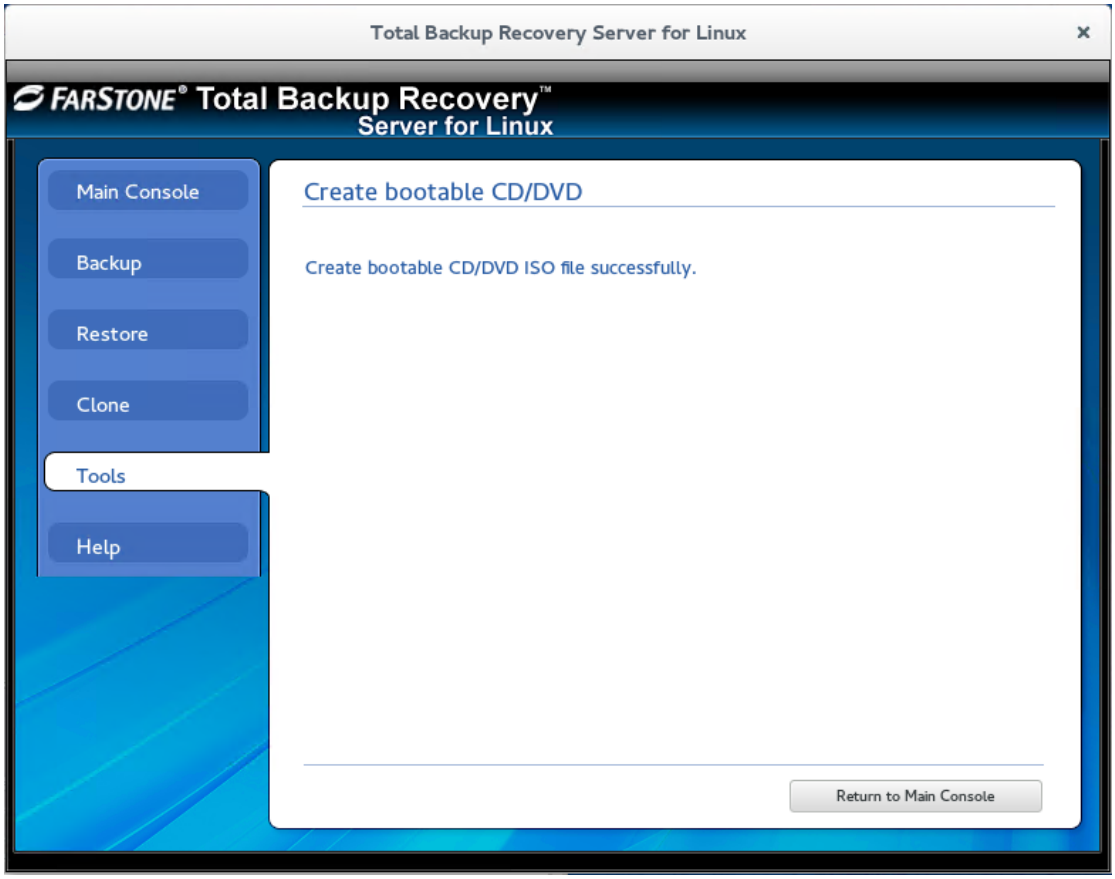



Total Backup Recovery Server for Linux
FARSTONE® Total Backup Recovery™
Server for Linux
Main Console
Backup
Restore
Clone
Tools
Help
Create bootable CD/DVD - ISO Source
Download bootable ISO file integrated with our program
Download our latest bootable ISO file from below link, burn it to CD/DVD. Our restoration program will automatically run after booting your computer with the CD/DVD.
latest bootable ISO file
Add our restoration program into an ISO file
You need first download Linux LiveCD from related official websites from below linux websites, and then add our restoration program into root directory of your selected ISO file.
Linux official websites
Manually run our recovery program
Our recovery program resides in folder "/usr/TBRLinux" of the installation path. After booting your target computer with corresponding LiveCD, please copy this folder and run it by yourself.
< Back
Next >
Cancel


Total Backup Recovery Server for Linux
FARSTONE® Total Backup Recovery™
Server for Linux
Main Console
Backup
Restore
Clone
Tools
Help
Create bootable CD/DVD - ISO Location
Select or enter the location of the LiveCD ISO file.
/root/LiveCD.iso
Name
7
Desktop
Documents
Downloads
LiveCD.iso
Music
Pictures
Public
RestoreCMD
TBRLinux_Setup_en-20140911
Templates
< Back
Next >
Cancel

Click **Continue** in the popup window to create the new TBRL ISO file.


Total Backup Recovery Server for Linux
A new ISO file named "LiveCDYYYYMMDD.iso" will be created to the same directory within several minutes. Are you sure to continue?
FARSTONE
Continue
Cancel



3. After the new ISO file was created, please burn it into a CD/DVD, and use it to boot target machine.

4. Run below command line to enter restore UI

$ su –
# mkdir /cdrom
# mount /dev/sr0 /cdrom
# cd /cdrom
# ./RestoreGUI64

Note: above commands are only suitable for 64bit computers. If you fail to get root privilege, please run "$ sudo passwd" first.

8.3 Manually run our recovery program

Boot your target computer with a Linux LiveCD, and then use the command line to run our restore program. Please refer to 7.3 for details.

8.3.1 Define Command Line Tool parameter

Enter "RestoreCMD -- help" or "ResotreCmd – h" in command line to see the definitions of all parameters.
The basic usage of

Usage: RestoreCMD [OPTION...] BACKUP-FILE

Restore command line examples:
RestoreCMD -l /tmp/file.D00
RestoreCMD -t 2 -d /dev/hda1:/dev/hda1,/dev/hda2:/dev/hda2 /tmp/file.D00
RestoreCMD -t 2 -f /target /tmp/file.D00

Mandatory arguments to long options are mandatory for short options too.
-l, --list List information of the image file
-t, -- incremental index number index number in the result of "-l" command,
only available for incremental restoration.
1 means restoring Complete Backup, >2
means restoring incremental backup files
according to its index number
-d, --dest=src1:dest1,... Set source volume and destination volume. Volume

before ":" is the backed up volume in the image,
and volume after ":" is the target volume of current
computer to be restored.

-f, --file=directory File restore to directory

-g, --grub=partition:device Grub boot information stores in head position of hard
drive and in files of some partition. "partition" means
the partition where grub files reside, and "device"
means which hard drive you want to set to be
bootable.
Without the parameter "-g", the first hard drive will be
set to be bootable.

-v, --verbose verbosely list processed

-h, --help list help information

BACKUP-FILE is absolute path of a complete backup file (not an incremental one), so its file extension must be ".D00".

Let's specify the three examples below:

(1) RestoreCMD -l /tmp/file.D00

Display all information of a complete backup image (its path is "/tmp/file.d00)

(2) RestoreCMD -t 2 -d /dev/hda1:/dev/hda1,/dev/hda2:/dev/hda2 /tmp/file.D00

This command will restore the first incremental backup of "/tmp/file.D00", and the volumes "/dev/hda1 & ""/dev/hda2" in the image will be restored to volumes "/dev/hda1" & " /dev/hda2" of the current computer.

"/dev/hda1" after the "-d" means source volume in the backup image, "/dev/hda1" after ":" means restoration target volume of current computer; "/dev/hda2:/dev/hda2" means the second volume "/dev/hda2" to be restored to "dev/hda2". "/tmp/file.D00" is path of the complete backup image.

(3) RestoreCMD -t 3 -f /target /tmp/file.D00

This command will restore all files in the second incremental backup of "/tmp/file.D00" to the folder "/target". If you only want to restore part of all files, please operate restoration by our X-Windows UI.

(4) RestoreCMD –g /dev/sda1:/dev/sda –d /dev/sda1:/dev/sda1 /usb/bak.D00

The parameter "/dev/sda1:/dev/sda" after "-g" means your Grub files are in the partition " dev/sda1", and you set hard drive "/dev/sda" as bootable device.

8.3.2 Prepare target storage

Before restoration, you need to format hard disk of target computer, partitioning or create logic volume. Details refer to 8.3.4.

8.3.3 Restore

Here is an example of restoring image. If the name of image file is /mnt/backup/all.D00", and the image contains a partition /dev/sda, one Logic volume (LVM) named "/dev/mapper/VolGroup-lv_root" and a hardware RAID /dev/mapper/ddf1_4035 305a0590430220202020202020d2b379623a354a45. Now, we need to restore source partition"/dev/sda" to target computer's partition"/dev/hda3".

(1) Use Command Line Tool to view the content of image
See the Partition/LVM information of the image"/mnt/backup/all.D00"

```
[root@localhost ~]# ./tbrlinux-cmd -l -f /mnt/backup/all.D00
-------file: /mnt/backup/all.D00 device:
-------multi file::
Getting config file, Please waiting...
1: device (/dev/sda1)
2: device (/dev/mapper/VolGroup-lv_root)
3: device (/dev/mapper/ddf1_4035305a0590430220202020202020d2b379623a354a45)
```

Tip:
When the system has hardware RAID, the disk will be recognized as /dev/mapper/isw_djjfbifgjj_Volume0, and if it has software RAID, the disk will be recognized as/dev/md0,/dev/md2, so we need to confirm that hardware RAID is under the path of "/dev/mapper/", and software RAID is under " /dev/md**".

(2) Run fdisk command, check the partition information of target computer

```
[root@localhost ~]# fdisk -l |grep /dev/
Disk /dev/sdb doesn't contain a valid partition table
Disk /dev/sdc doesn't contain a valid partition table
Disk /dev/mapper/VolGroup-lv_swap doesn't contain a valid partition table
Disk /dev/mapper/VolGroup-lv_root doesn't contain a valid partition table
Disk /dev/mapper/ddf1_4035305a059043022020202020202020d2b379623a354a45 doesn't contain a valid partition ta
Disk /dev/mapper/VolGroup-lv_home doesn't contain a valid partition table
Disk /dev/sda: 200.0 GB, 200048565760 bytes
/dev/sda1   *        2048     1026047      512000   83  Linux
/dev/sda2         1026048   390719487   194846720   8e  Linux LVM
Disk /dev/sdb: 2000.4 GB, 2000398934016 bytes
Disk /dev/sdc: 2000.4 GB, 2000398934016 bytes
Disk /dev/mapper/VolGroup-lv_swap: 6207 MB, 6207569920 bytes
Disk /dev/mapper/VolGroup-lv_root: 53.7 GB, 53687091200 bytes
Disk /dev/mapper/ddf1_4035305a059043022020202020202020d2b379623a354a45: 4000.3 GB, 4000330022912 bytes
Disk /dev/mapper/VolGroup-lv_home: 139.6 GB, 139619991552 bytes
```

(3) Run restore command （Please refer to section 7.3.1 for details）

1) Restore volume

RestoreCMD –d SourceVolume:TargetVolume Imagepath

Below example restores the partition "/dev/sda1"in the image"/tmp/test.D00" to target computer's partition"/dev/hda3".

RestorCMD –d /dev/sda1:/dev/hda3 /tmp/test.D00

2) Restore LVM

RestoreCMD –d SourceLVM:TargetLVM ImagePath

Below example restores source LVM "/dev/mapper/vg_fodra151_lv_root" in the image "/tmp/test.D00" to target LVM "/dev/mapper/vg_fodra151_lv_root":

RestoreCMD –d /dev/mapper/vg_fodra151_lv_root:dev/mapper/vg_fodra151_lv_root /tmp/test.D00

Tip:
If restore to the source device, you can do not set destination device, but need to keep the colon.

Need to create LVM in target computer first, refer to 7.2.4 for the creation command.

3) Set as the bootable hard disk

Set the partition/hard disk/LVM restored as bootable partition, please add the parameter "-g". The below example shows your Grub files are in the partition " dev/sdc1", and you set hard drive "/dev/sdc" as bootable device.

Restore –g partition:device imagefile

RestoreCMD –g /dev/sdc1:/dev/sdc –d /dev/sda1:/dev/sdc1 /test.D00

Please note: to set bootable information, parameters "-g" and "-d" must be used in the same command line.

Tip:
This version only support Grub-based boot, and only support one bootable partition; if you want to support multiple bootable partitions, please run related Grub command manually.

8.3.4 Use Linux command line to create partition/soft Raid/LVM

This Appendix will provide you some examples to create partition/soft Raid/LVM. Before running restoration command , users need prepare their storage with these disk commands.

1. Create partition
   (Take dividing ext3 primary partition from a blank disk as an example)

```
# fdisk /dev/sda
Command (m for help)  n        ←enter command "n" to select create partition
Command action                 ←prompt to select the partition type to create, here we
                                choose primary partition
     e    extended
     p    primary partition
Partition number (1-4)    1    ←select partition number, here is 1
First cylinder (1-****.,default 1)  ←select initialcylinder according to actual requirement,
                                you can choose the default one
Last cylinder (1-****,default *)  ←select end cylinder according to the need, it defaults to
                                the last cylinder
Command (m for help) w         ←enter command w , write in disk and exit
fdisk#mkfs.ext3 /dev/sda1          ←format it as ext3 partition
```

2. Create and recover a software Raid

Run "mdadm" to create software RAID, which resides on partitions or hard disks. Here is an example, create RAID "/dev/md0" based on "/dev/sdb" and "/dev/sdc"

mdadm–C/dev/md0–level=0 –raid-devices=2 /dev/sdb /dev/sdc

--level Set RAID level

--raid-devices=the number of devices (partitions or disks) which constitute raid

If the software RAID partition of Linux was existed on the disk, use following command to restore RAID:

mdadm–A /dev/md0 –raid-devices=2 /dev/sdb /dev/sdc

3. Create hardware RAID

Different RAID cards have different steps to create hardware RAID, please refer to corresponding vendor's manual to create it.

4. Create LVM

The following example shows create LVM on disk sdd

1) Create LVM partition

Here we create two partitions (1 and 2), use the same way to create more partitions.

```
# fdisk /dev/sdd
Command (m for help) n←enter command choose to create partition
Command action                    ←prompt to select the type of new created partition, here is
                                    primary partition
    e   extended
    p   primary partition
Partition number (1-4)  1         ←select partition number, here is 1
First cylinder (1-****.,default 1)  ←select initialcylinder according to actual requirement, you
                                    can choose the default one
Last cylinder (1-****,default *)  ←select end cylinder according to the need, it defaults to the
                                    last cylinder
Command (m for help)  t           ←change partition type, enter 8e change partition to LVM
                                    according to tips
Command (m for help) w            ←enter commandw, write in disk and exit fdisk
```

```
# fdisk /dev/sde
Command (m for help) n←enter command n choose to create partition
Command action                    ←prompt to select the type of new created partition, here
                                    is primary partition
    e   extended
    p   primary partition
Partition number (1-4)  1         ←select partition number, here is 1
First cylinder (1-****.,default 1)  ←select initial cylinder according to actual requirement,
                                    you can choose the default one
Last cylinder (1-****,default *)  ←select end cylinder according to the need, it defaults to
                                    the last cylinder
Command (m for help)  t           ←change partition type, enter 8e change partition to LVM
                                    according to tips
Command (m for help) w            ←enter command w, write in disk and exit fdisk
```

2) Create Physical volume on partition

```
# pvcreate /dev/sdd1 /dev/sde1
```

3) Create Volume group on Physical volume

vgcreate /dev/sdd1 /dev/sde1

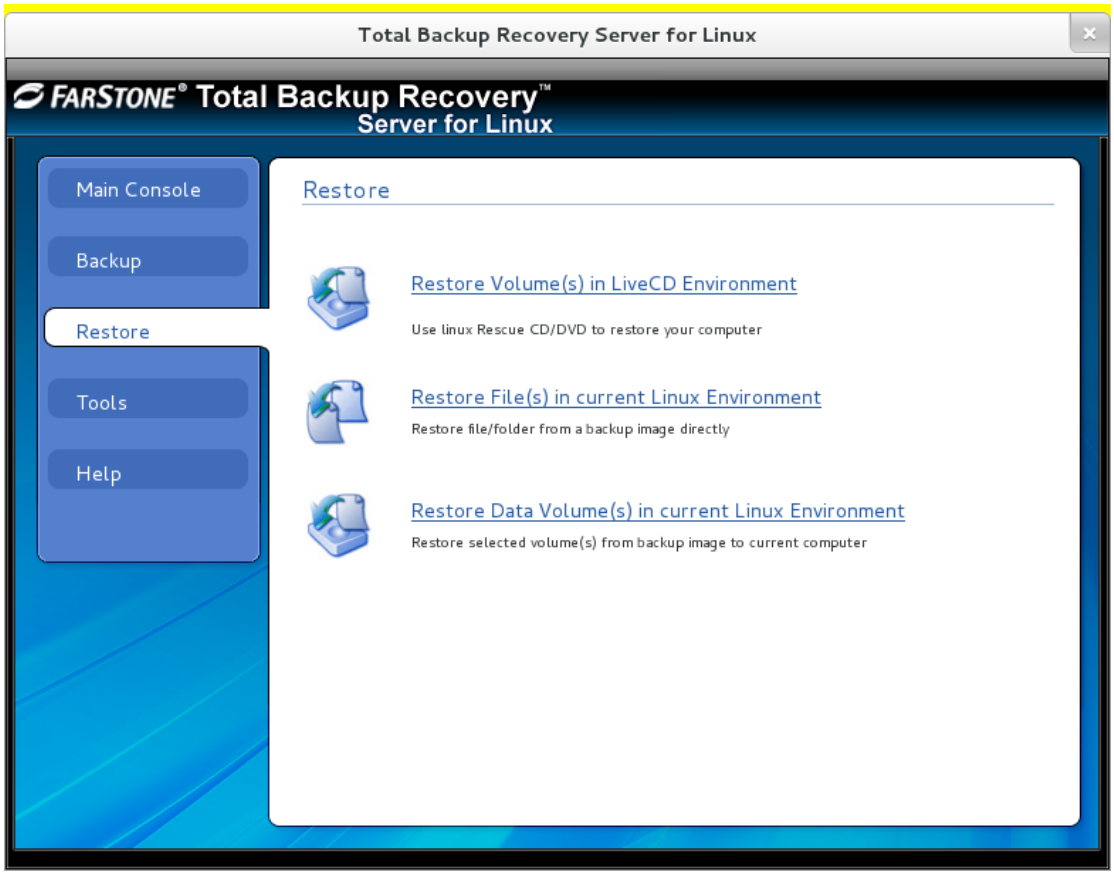
4) Create LVM at last

lvcreate -L [sizeMG] -n [LVname] VGname -L：It is followed the capacity. The unit of capacity can be M, G and so on, but note that the capacity need to be in accordance with the actual capacity of vg, or it will prompt error. -n：It is followed the name of Logic Volume

#lvcreate –L 18g –n lvtest vg0 If the command runs successfully, you'll see its returns "Logical volume "lvtest" created"

```
[root@localhost ~]# lvcreate -L 18g -n lvtest vg0
  Logical volume "lvtest" created
```

8.4 Restore Data Volumes


Total Backup Recovery Server for Linux
FARSTONE® Total Backup Recovery™
Server for Linux
Main Console
Backup
Restore
Tools
Help
Restore
Restore Volume(s) in LiveCD Environment
Use linux Rescue CD/DVD to restore your computer
Restore File(s) in current Linux Environment
Restore file/folder from a backup image directly
Restore Data Volume(s) in current Linux Environment
Restore selected volume(s) from backup image to current computer

Restore selected data volume(s) from backup image to current computer,. As for system volume, you have to boot your target computer with bootableCD/DVD, and then restore backup image under such environment.

Chapter 9 Tools Introduction

9.1 Check Image

Check whether the image was damaged.

1. After clicking “Check Image” in the “Tools” tab page, Choose a path for your backup image;

2. Check the result. If the result is negative, you need redo your backup job.

9.2 Create a Bootable CD

You may download customized ISO file from our website, or download standard ISO file from Linux official websites. The difference is that the customized ISO will run our recovery UI when you boot target computer; while you not only need extra steps to add our recovery program to standard Linux ISO file, but also need enter commands to run our recovery UI.

Please refer to Chapter 8.1 & 8.2 for details.

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